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ALTAIC NUMERALS

For Karl H. Menges to his 90th birthday (April 22, 1998)

The Altaic hypothesis supposes a genetic relationship of Turkic, Mongolian, Tungus, Korean and Japanese. One of the most frequent arguments of its opponents (Clauson, Ščerbak) is based on an imaginary absence of common numerals. The presence of common (= inherited) numerals represents certainly an important argument for a genetic relationship. But its absence has no declaring value — there are more safely related languages without any related numerals. The recent progress in a comparative historical phonology of Altaic languages allows to identify more inherited numerals and to differentiate them from the numerals of substratal or adstratal origin.

The most promising set of regular correspondences among Altaic branches and the reconstruction of the Proto-Altaic consonantism was made by Starostin (1986: 104 and 1991: 21) and Vovin (1994: 100):

Rule	Proto-Altaic	Proto-Turkic	Common Mongolian	Proto-Tungus	Middle Korean	Proto-Japanese
1.	*p*	*Ø-, *-p-	*φ > h-, -b-	*p	p-, p(h)	*p
2.	*p	*b	h-, -γ- / -w-	*p-, *-b-	p-, -w-	*p-, -m-
3.	*b	*b	b-, -γ-	*b-, *-w-	p	*p / *b (-m- / -γ-)
4.	*-w-	*-b- / *-Ø-	-b- / -γ-	*-w- / *-y-	-Ø-	*-w- / *-Ø-
5.	*m	*b-, *m	m	*m	m	*m / *-Ø
6.	*t*	*t	t, č(i)	*t, *čj-	t-, t(h)	*t
7.	*t	*d-, *-t-	d, ʒ(i)	*d-, *ʒj-, t-	t-, -r-	*t / *d
8.	*d	*j-, *-d-	d, ʒ(i)	*d, *ʒj-	t-, -r-	*t / *d, -y- / -Ø-
9.	*n	*j-, *-n-	n	*n	n	*n / *-Ø-
10.	*-r ₁ -	*-r-	-r-	*-r-	-r-	*-t- / *-r- / *-Ø
11.	*-r ₂ -	*f > *-z- ~ Ch -r-	-r-	*-r-	-r-	*-t- / *-r-
12.	*l ₁	*j-, *l	n-, l	*l	n-, -r-	*n-, *-r-, *-Ø
13.	*-l ₂ -	*f > *-ʃ- ~ Ch -l-	-l-	*-l-	-r(h)-	*-s-
14.	*s	*s	s	*s	s- / h-, s	*s
15.	*ʃ?		s	*ʃ		
16.	*z?	*j	s	*s	s-	*s
17.	*č*	*č	č	*č	č-, č(h)	*t
18.	*č	*d-, *-č-	d-, -č-	*č-, *-s-	č	*t-, *-s-
19.	*ʒ	*j	ʒ	*ʒ	č	*d-, *-y-, *-Ø
20.	*n ₁	*j-, *-n-	n	*n ₁	n-, -n-	*n- / *m-, *n, *-Ø

Rule	Proto- Altaic	Proto-Turkic	Common Mongolian	Proto- Tungus	Middle Korean	Proto-Japanese
21.	*-y-	*-j-	-y-	*-y-	-y-	*-y-
22.	*k*	*k-, *-k- / *-γ-	k-, -k- / -γ-	*x-, *k	k/h-	*k
23.	*k	*g / *k	k-, -g-	*k-, *g	k-, -h- / -Ø-	*k
24.	*g	*g	g-, -γ-	*g	k-, -g- / -h- / -Ø-	*k-, *-w- / *-y- / *-Ø-
25.	*ŋ	*Ø-, *ŋ	*Ø-/g-, -ŋg- / -γ-, - n	*ŋ	n- / Ø-, ŋ / Ø	*n- / *m- / *Ø-, *-m- / *-n-

Note: 1) Starostin 1991: 119–120, fn. 13 postulates the palatalized reflex $\check{c}(i)$ -; our objections are explained in #20.

Turkic numerals

The Proto-Turkic reconstructions follow Mudrak (1993), including his specific transcription of proto-phonemes (Mudrak ~ Starostin / Vovin): $t = d$, $t^{\check{c}} = t / t^h$, $\check{c} = \check{c}$, $\check{z} = j$ etc.

	Proto-Turkic modified after Mudrak 1993	Volga-Bulgarian Benzing 1959	Chuvash		Old Turkic Kononov 1980	Khalaj Doerfer 1971
			Baitchura 1994 weak	strong		
1	*bŷr	*bir	pŷr	pŷrre	bir	bŷ
2	*ŷkki	*iki	ik(ŷ)	ikkŷ	iki, ęki	ikkŷ / ikki
3	*ŷ'č	*večim "3rd"	vič(ŷ)	viččŷ	üč	üč / ič
4	*kŷrtA	*rtŷŷ	rtŷva(ŷ)	rtŷvttŷ	tŷrt	kŷ'rt / tŷ'rt
5	*bŷčk	*bičl	piččk	piččk	bęč, bič	bŷč
6	*altŷ	*altŷ	ult(ŷ)	ultŷ	altŷ	altŷ
7	*čet(t)i	*jŷttŷ	ŷič(ŷ)	ŷiččŷ	jtŷ, ęjtŷ	yŷtti
8	*sek(k)iŷ	*sčkir	sčkŷr	sčkčŷr	sękiz	sčkkiz
9	*tok(k)uŷ	*toxur	tŷhŷr	tŷhčŷr	toquz	toquuz
10	*ŷn	*van	vun	vunnŷ	on	ü'n
20	*čęęirbi	*jŷirim		ŷirčm	ęęirmi, jęirmič	yęirmi
30	*ottuŷ- *oltuŷ	*votur		vttŷr	otuz	hottuz
40	*k'ir'k - *k'	*qŷrę		hčrčh	qŷrę	qŷrę
50	*el(t)ię	*tŷi		altŷ	ętię, itię	älli
60	*altbič			utttŷ	altttŷ	altttŷ
70	*četbič			ŷttttŷ	ęttttŷ, jtŷttŷ	yŷttttŷ
80	*sek(k)iŷ-ŷn		sčkŷrvun	sčkŷrvunnŷ	sękiz on	sej(x)san
90	*tokkuŷ-ŷn	*toxur-van	tŷhčŷrvun	tŷhčŷrvunnŷ	toquz on	Doxsan
100	*čŷŷ	*jŷr		čŷr	jŷz	yŷz / yŷ'z

Comparative-etymological analysis

1. Tk *bŷr "1" is usually compared with WrMo *bŷri*, Khalkha *bŷr* etc. "each, all" (Ramstedt 1907: 5). Miller 1971: 230 adds OJp *pito-tu* < *pitŷ and MKor *pŷrčs*, *pŷrčsŷ* "at first; to begin". Starostin, Dybo & Mudrak reconstruct pAlt *bŷri. See also Starostin 1991: 99, who prefers *birV.

Tenišev 1978: 110 connects Tk "1" with *barmak "thumb". Čanyšev 1985: 78 adds Tatar *biręi* "near" and OTk *berü* "hither". His comparison with IE *perH₂- "front, first" is doubtful.

2. Tk **əkki* “2” has not any safe etymology. Ramstedt 1949: 195 compared it with Kor *pegim* [= *pəktim*] “the next, the following, the one following” (with the same suffix as *čejm* “the first”). Starostin 1991: 284 adds OJp *p(w)oka*, Ryukyu *fōká*, Tokyo *hōka* (**pəka*) and reconstructs pAlt **p'ek*'V. The expected semantical development is plausible, cf. Latin *secundus* “2nd” vs. *sequor* “I follow”. But the initial pAlt **p'*- implies *h*- in Khalaj, an archaic Turkic language from Iran. And here only the form *äkki* is attested (cf. Doerfer, *OLZ* 66[1971]: 439). But it is possible to etymologize this numeral on the basis of the same semantic motivation. In **-ki* the suffix of ordinals can be identified, cf. Tuvín *birgi*, *ijigi*, *üškü*, *běški* “1st, 2nd, 3rd, 4th, 5th”, OTk *baštĩŋki* “1st” (Ščerbak 1977: 151). A hypothetical primary root can be found in the verb **eg-*, cf. **eg-er-* “to follow” > Chagatai *eger-*, Uzbek *egir-*, and with another extension Lobnor *ej-eš-*; a simple root probably appears in OTk *iv-* “to follow” — see Sevortjan I: 242 (the phonetic development has an analogy e.g. in OTk *övür-*, *öwür-* vs. Uzbek *ogir-* “to turn”, see Sevortjan I: 498–499). A connection between **əkki* “2” and **eg-(er-)* was already anticipated by Vámbéry (see Sevortjan I: 245) and recently Tenišev (1978: 112). The attempt deriving the numeral from the verb **ek-* “to sow” (Čanyšev 1985: 78 following Vámbéry, cf. Sevortjan I: 252) is not convincing for semantical reasons.

In principle, at least as an alternative, an Iranian origin must also be taken in account, cf. Modern Persian *yek dīgar* “one second”, *yek yek* “one each”, Zoroastrian Pahlavi *ēk ēk*, Yaghnobi *iki iki* “one by one” (Emmerick 1991: 334–335).

3. Tk **ü'ć* “3” (traditionally **üč* — see Räsänen 1969: 518) is also rather puzzling. Ramstedt 1907: 9 compared it with WrMo *üčü-ken* “small”, related to Tg **güči-kün* id. (Starostin 1991: 18, 43), explaining “few” > “3” (or vice versa !). Čanyšev 1985: 79 connects **üč* with **üč* “end, point, edge, beginning” (Sevortjan I: 612–613). Semantically it is really possible, cf. e.g. Dravidian **muŋ-* “3” derived from **muŋ-* > Tamil *muŋ* “in front, prior”, *muŋai* “front, face, point, sharpened end, edge” etc. (Andronov 1978: 242; DEDR 5020, 5052). The semantic motivation could look as follows: “protruding (finger)” > “middle-finger” > “three”. But the different anlaut in Khalaj *hūuč* “end” vs. *üš/īč* “3” excludes this etymology. In Lamut dialect of Kamchatka Bay Messerschmidt recorded a unique form *üttan* “3” (Anderson 1982: 53). If it is not just a misprint (cf. *ullan* by Strahlenberg 1730), it could reflect an original **üt-lan* or even **üč-lan*, fully compatible with Tk **üč*. The internal structure can also be recognized here. There was a suffix of ordinal numerals **-č(i)* attested in a simple form in Chuvash *-š* (*pěřěš* “1st”), perhaps in Yakut *-s* (*ikkis* “2nd”, *ühhüs* “3nd”, *uon bīris* “11th” etc), and in the Common Turkic compound suffix of ordinals **-inč(i)* (Ščerbak 1977: 144–150). The development could look **ut-* & **-č(i)* > **üč*. The meaning “3” may not be the oldest. Gordlevskij (1945: 141) demonstrated that in Kyrgyz, the form *uč* appears in children’s games in the meaning “5”. In the game imitating a fight for the

main tent of the Qayan, the idiom *qbrqɬn ucu* “200” = “40 x 5” was used. If the meaning “5” was primary, the numeral **ũč* resembles very suggestively Kogurjō *ūc/utu* and pJp **itu-* “5” (see Japanese numerals, # 58).

There is again a possibility of Iranian origin, cf. Buddhist Sogdian *ʔšty-* & *čšty-*, Khwarezmian *šy* “3” (Emmerick 1991: 321). A similar sound substitution is known e.g. from Ujgur *učmaq* (but OTk *uštmax*, *učtmax*, Chuvash *šātmax*) “paradise” < Sogdian *ʔwštɬmʔχ* (Sevortjan I: 614).

4. Tk **tōrt* “4” = **tōrd* (Poppe) = **tōrt* (Räsänen) = **dōrt* (Dybo) has been compared with Mo *dörben*, Tg **dujgin* and pJp **də-* “4” (Ramstedt 1907: 7–8; Hamp 1970: 194; Miller 1971: 220–221; Miller 1996: 116 adds the puzzling early MKor *towi* etc. “3”, corr. “4”, recorded in Japanese *kana*-syllabic script — see # 46). The final dental can perhaps be identified with the plural-collective marker attested in OTk *-t* (cf. *oylīt* “descendants” — Kononov 1980: 147). An indirect evidence can be found in Mo *guč̄in*, *döč̄in* “30”, “40” < **gurtin*, **dörtin* (cf. also Kyrgyz *qbrqɬn* “40” quoted above). Hamp (1970: 194) reconstructs even pMo **gurt-guan* “3” & **dört-guan* “4” with **-t*. Poppe 1960: 110 assumed that the only regular correspondence to Mongol-Tungus **d-* is Turkic **j-*. He concluded that the Tk numeral must be borrowed. Starostin, following the idea of Illič-Svityč and Cincius about three series of occlusives, postulates the response nr. 7 (see above) and reconstructs pAlt **tōr* ~ **tūr* (1991: 71). More about a possibility of an inner Altaic etymology see # 22. Čanyšev 1985: 79 rejects the traditional Altaic comparanda and offers his own solution based on the identification of the final **-t* with the last syllables **-ti*/**-ti* of the numerals “6”, “7”, postulating their original meaning “finger”. The root proper has to be related to **tūr-* “zusammenrollen” (Räsänen 1969: 506). Doubtful.

There is again an alternative to seek an Iranian origin of this numeral, cf. Old Iranian *(*x*)*turšya-* > Avestan *tūriia* “4th”, *āxtūirīm* “four times”. But the form **turθa-* (Bartholomae), much more resembling Tk **tōrt* did not exist in Iranian (Emmerick 1992: 321–324).

Róna-Tas (1974: 504) tried to identify the source of Tk “4” in Tocharian B *štwer* “4” (similarly the numerals 5, 7, 8, 20, 10000 should have also been of Tocharian [B] origin).

5. Tk **bētk* “5” reconstructed by Mudrak (1993: 94 - 95; his comparison with IE **penkʷe* is doubtful) solves better the difference between Common Turkic **bēš* and Chuvash *pil(l)ěk* than the reconstructions of other authors (Räsänen: **bāš*, Doerfer: **bēš*, Sevortjan: **bēš*, Serebrennikov & Gadžieva : **bāš-* < **bāl-*), and at the same time confirms the old comparison with Tk **bilek* “wrist, forearm, arm” // Mo *bile* “wrist”, Kalmyk *bülkq* “forearm” < **bilükēn* // Tg **bile*-(*ptun*) “wrist” (Ramstedt 1907: 12–13; Poppe 1960: 117; Räsänen 1969: 76; Sevortjan II: 126, 145–146), cf. yet MKor *phār* “arm” < **pār*h (Starostin).

Benzing 1959: 731 sees in the Tk “5” an Iranian borrowing (cf. Persian *panža*). Concerning the final *-k* in Chuvash, he finds an analogy in Urdu *pančak* “the group of 5”. Róna-Tas 1974: 502 derives Tk **bēš* from Tocharian B *piš* “5”.

6. Tk **altī* “6” has not an unambiguous etymology either. Ramstedt (1907: 15) sees in this word an alternative name for “thumb” derived from **al-* “to take”, similarly as **barmak* “thumb, finger” can be connected with Mo *bari-* “to catch”. Čanyšev (1985: 80) presents a modification “take a finger” on the basis of his fictive **tī* “finger”. Hamp (1974: 675–676) analyzes the numerals **alt-biř* “60”, **řet-biř* “70” as “the first after 50”, “the second after 50”, identifying **alt-* with OTk *alt* “bottom”, *al* “side”, *alīn* “forehead”; cf. Chagatai *al* “front side” (Räsänen 1969: 14; Sevortjan I: 124). It would mean “6” = “[1] before [5]”. This point of view can be supported: if Mudrak, reconstructing Old Bulgarian **etə* “5”, is right, the second component of this numeral can be identified with the Old Bulgarian “5” (the same can be said about the following numeral “7”).

7. Tk **řet(t)i* “7” = **jātti* (Starostin) = **θāti* (Ščerbak) = **dētē* (Doerfer) is also without any convincing etymology. Starostin (1991: 141) adds Tk **jātti* (< **jāddi* ?) to Tg **nada-n* and OJp *nana-* “7” without any deeper etymological attempt. Ramstedt (1907: 16) connects the numeral with the verb **řē* “to eat” (Räsänen 1969: 194), seeking an analogy in Mo *doluyan* “7” vs. *doluya-* “to lick”. Hartman (*Keleti Szemle* 1[1900]: 155) reconstructed **jet-di*. Supposing a specific role of the numeral “7”, he derived it from the verb **jet-* “erreichen, genug sein” (Räsänen 1969: 199).

In the first component of the numerals “7”, “70”, Hamp (1974: 675–676) sees a regular Turkic counterpart of WrMo *řitüger* “the second wife in a bigamous family” (but *-t* is an integral part of the suffix, cf. *řu-tuyar* “3rd” etc.).

Róna-Tas (1974: 500) admits that a hypothetical connection of Tk “7” and pre-Tocharian B **septe* “7” is very problematic.

8. Tk **sek(k)iř* “8” is segmentable in **ek(k)i* “2” & **-ř* ‘dual marker’; for the initial **s-* the meaning “without” can be expected. Its direct traces are not evident in Turkic, but the negative verb in Mongolian and Tungus represent a hopeful evidence (Ramstedt 1907: 16–17): WrMo, MMo, Urdu *ese*, Daghur *es*, Monguor *se* etc. “not to be” (Poppe 1955: 287–288)// Ewenki *gsin-* “not to be”, Olcha *-asi/-esi-* etc. (TMS II: 432; Poppe 1960: 65). Ramstedt 1982: 51 adds Kor *ętta :esę* : *ęsin* “to be contrary, be sideways”, cf. WrMo *esergü* “contrary”, *esergüče-* “to oppose”; Miller (*CAJ* 29[1985]: 45) finds further OJp *ese* “wretched, miserable, worthless, displeasing, poor”. A hypothetical cognate in Turkic can be identified in the word-pair **ās-irkä-* vs. **irk-*, cf. MTK *āsirgā(n)* “sich über einen Verlust betrüben”, Azerbaijan *āsirgā* “nicht gern geben” vs. MTK *irk* “sammeln” (Räsänen 1969: 50, 173). Cf. also the

OTk negative suffixes *-siz*, *-sīz*, *-suz*, *-süz*, *-sul* (Kononov 1980: 107; Menges, CAJ 18[1974]: 198).

9. Tk **tokkuř* “9” = **tokkaz* (Doerfer) = **toqyz* (Serebrennikov & Gadžieva) = **dokkəz* (Dybo) is compatible with Tg **togar* “span; четверть (measure)” (TMS II: 190–191) and WrMo *töge*, Khalkha, Buriat, Kalmyk *tō* “span (between thumb and middle finger) (Ramstedt 1935: 408); cf. also Tk **t/dogar* “ausspannen” (Räsänen 1969: 483). More about the connection of the verb “to stretch” with denotations of spans and consequently numerals in Indo-European see Schmid 1989: 23–24 (cf. IE **tens-* “to stretch”: Old Indic *vitasti-* “span” or Slavic **ръно рети* “to stretch” : **рѣдъ* “span”, similarly Lithuanian *kėsti*, *kečiū* (**kʷetyō*) “ausbreiten, ausspannen” vs. IE **kʷetwōr-* “4”, originally perhaps “span”). Ramstedt 1907: 17 assumed a connection with WrMo *toya* “number” without any further explanation. Miller 1971: 236 quotes the opinion of Lee about a connection of Tk “9” and Kogurjō *tə(k)* “10”. Later Ramstedt (1957: 66) compared Tk “9” with Mo *toqur* ~ *tokir* “with inflexible fingers” (Ramstedt 1935: 398). Burykin’s comparison of Tk “9” and WrMo *doluyan* “7” (1986: 30) is quite doubtful.

10. Tk **ōn* “10” resembles suggestively MKor *ōn* “100” (Ramstedt 1949: 177), cf. Tg **žuwan* “10” vs. WrMo *jayun* “100”, and the OKor (pSilla) suffix of tens **-on* / **-un* (Krippes 1991:149). Ramstedt 1907: 20 also connected Tk “10” with the suffix *-an* of tens in Mongolian, demonstrating the process of the change **-on* > **-an*. The primary meaning can be reflected in MMo (Secret History) *ono-* “zählen” (Haenisch 1939: 125), compared with WrMo *onu-* “verstehen, das Ziel erreichen, treffen”, Even *ünü-* ~ *ōnū-* ~ *ōno-* “to understand, think” (Poppe 1960: 70; TMS II: 275). On the other hand, there is Tg **oñō* “picture, ornament” (TMS II: 20), semantically comparable with MMo *har* “ornament”, metaphorically perhaps “sign” > “number” (?) — cf. # 28. Ramstedt’s attempt to include here also WrMo *on* “year”, must be rejected not only because semantics (1 year = 12 months), but also for phonetic reasons (pMo **φon* > MMo *hon*, Monguor *fān*, *χuan*, Khitan *po* — see Ligeti, AOH 10[1960]: 237–238; Kara 1990: 298); Mo > Manchu *fon* “time” // Kor *pom* “spring” with *p-* absent in *ōn* “100” — see Poppe 1955: 30; Id. 1960: 155; also Khalaj *ūʾn* “10” without the expected *h-* excludes this comparison). Čanyšev 1985: 81 (cf. also Hamp 1974: 676) compares Tk **ōn* “10” with *oŋ* “right” (“10” = “right hand ready” ?), referring to Old Kypchaq *ong* “10” (Sevortjan I: 455–460).

11. Tk **žęgirbi* “20” has usually been reconstructed with medial **-rm-*, cf. **θiγʾirmā* ~ **θāγʾirmā* (Ščerbak), **žęgirmi* (Mudrak). Serebrennikov & Gadžieva 1979: 127–128 reconstruct **jiγʾirbə* esp. on the basis of Yakut *sūr̄bə*, Shor *čęgirbe*, Tuvin *čērbi*, Lebedin *jägārbā* etc. (cf. Sevortjan IV: 202; Poppe 1960: 87 about the tendency **-rb-* > **-rm-* in Turkic). The priority of

the cluster **-rb-* confirms the hypothesis of Ramstedt (1907: 21) connecting the segment **-Vrbi* with WrMo *arban* “10” and a hypothetical Tg formant of tens **-arma-gi* > Solon *nadarangı, -inyı* “70”, *zabkorinyı* “80” etc. Later Ramstedt (1957: 66) offered a different solution: a comparison with MMo (Secret History) *ji’ürme-de-* “to double” < **žiyür-*. But Haenisch 1939: 91 translates MMo *ji’ur-me-* “noch zunehmen, noch schlimmer (stärker) werden”. Regarding the existence of a parallel numeral for “20” in Turkic (**ikōn* reconstructed by Ščerbak 1979: 139) with a transparent internal structure (2 x 10), the form **žęgirbi* can represent a compound of originally Mongolian words **žiyür-(me-)* & **[ø]arba(n)* “double ten”. Hamp 1974: 676 connects the Tk numeral “20” with *jigıt* “youth, young man”, postulating **jig-* “new, fresh”. This explanation of the semantic motivation (“new” = “next ten” ?) is not convincing.

12. Tk **ottuř ~ *oltuř* “30” (Mahmud Kařgari had also recorded the meaning “3” — see Sevortjan I: 489) has no safe etymology. Hamp 1974: 676 proposes a dissimilation from **ortuř*, a derivative of **orta* “middle”, supposing “middle (finger)” > “third (decad)”. There are additional facts supporting and precizing just this solution: (1) The stem *orta* is really used for a denotation of the “middle finger”: Sary-Yugur *urtamaq*; Kyrgyz, Kazakh *ortan qol*, Teleut *orton qol* (Sevortjan I: 476–477); (2) The forms each as Uygur *ot(t)ur*, *ottura*, Lobnor *ottoyo*, ? Chuvash *varri* “centre” (Sevortjan I: 474–475) differ from the variant **ottuř* only in final *-r//-ř*. But this attractive etymology must be rejected because of a different anlaut in Khalaj *hottuz* “30” vs. *ořta* “middle”.

Ramstedt 1957: 66 connected the Tk “30” with Kor *pottāri* “bundle, knot”, although the semantic motivation remains puzzling. This comparison implying an original Alt **p^h-* can be supported by the reconstruction of pre-Tk **p-* based on Khalaj *hottuz* (Doerfer, *OLZ* 66[1971]: 326 reconstructs Tk **pottaz*).

13. Tk **k⁽ⁱ⁾ırk* “40” is again without any unambiguous etymology. Halévy 1901: 40 speculated about a multiplication **ęk(k)i-ř žęgirmi* “2x20” > **kⁱıřg* > **kⁱırk*, cf. the innovative formation of the same internal structure in Balkar *ęki jįjırma* “40” = “2x20” (Ščerbak 1977: 141 also quotes other examples of traces of the vigesimal system, e.g. Old Azerbaijan *iki fįırx* “80” = “2x40”). Hamp 1974: 676 seeks a source in Tk **kır* “edge” (Kazan Tatar, Teleut), usually “mountain (ridge), shore, bank”, even “field, steppe”, while the derivative **kıręg* has the meaning “edge, side, border” (Räsänen 1969: 265–266). Hamp proposes a semantic motivation “edge (of the hand)” > “4(0)”. This semantic interpretation can be supported, if our etymology of pAlt **dör[i]* “4” is correct (# 22). Hamp’s alternative attempt connecting the numeral with **kıra-* “be short”, **kırık* “narrow” (“short finger” > “4(0)”) is not more convincing.

14. Tk **el(l)ig* “50” has been connected with Tk **el(ig)* “hand” and **el(l)ig* “breadth of the finger / of the palm of hand” (?) (Sevortjan I: 260,

263–264, 266–267; Ramstedt 1907: 13 also quotes Uryanchi *äldik* “glove”; Gordlevskij 1945: 135; Räsänen 1969: 39; Hamp 1974: 676); *-lig* is probably an adj. suffix (Räsänen; Schott 1853: 18 saw in Tk **-lig* a counterpart to Fenno-Ugric **luki* “10”). The deviated form *ittik*, appearing in Zenker’s *Dictionnaire Turc-Arabe-Persan, I (Leipzig 1866)*, 8 and Vel’jaminov-Zernov’s *Slovar’ Džagatajsko-Tureckij (1868)* is isolated and perhaps wrongly recorded (Radloff I: 824). On the other hand, it suggestively resembles Old Bulgarian **etā* “5” (Mudrak p.c.) // Kogurjō **utu*, pJp **itu* id. (cf. # 57).

15. Tk **alt-biř* “60”, **žet-biř* “70” (usually reconstructed **alt-mil₂*, **jet-mil₂*, but Kazakh, Karakalpak, Nogai *alpīs* “60”, Kazakh, Karakalpak *žetpīs*, Nogai *jetpis*, Karakyrghiz *jetpiš* “70” confirm **b* instead of **m*, cf. also Serebrennikov & Gadžieva 1979: 127) consist of two components: (1) the stem identical with the numerals “6”, “7”; (2) the stem, which can be identified with the numeral “5”. Probably the most convincing solution was presented by Hamp (1974: 675): **alt-biř-ōn* “(1st + 5) x 10” or “the first (decade) after 50” > **alt-biř* “60” **žet-biř-ōn* “(2nd + 5) x 10” or “the second (decade) after 50” > **žet-biř* “70”. The parallel formation **biř-ōn* “50” really exists, cf. Osman Turcic *beř on* (in Laws of Sulaiman the Magnificent, 16th cent.), Sary Uygur *pis'on*, Shor *pězon*, Altai, Tuvín *běžēn*, Tofalar *běžon*, Yakut *biēs uon* (Gordlevskij 1945: 136, 138; Ščerbak 1977: 140). The idea connecting the formant **-biř/-biř* with **bētk* “5” was probably first formulated by Dəmirčizadə (1968) — see Sevortjan I: 141 including the other etymological attempts.

A new etymology was proposed by Miller (1996: 145). He compares Tk **-mil₂* with Kor *-mīr* in *sīmīr* “20” (see #44), mentioning also NKor *mūs* “(a bundle of) ten (sheaves, fish, etc.), a plot of land from which ten sheaves of tax-grain are collected”.

16. Tk **sek(k)iř* *ōn* “80”, **tokkuř* *ōn* “90” are also preserved as separate forms in the monuments of 8th cent. (Türkü, Uyghur and Manichean dialects). Only from 9th cent., a contraction appears, cf. Xakani *seksōn*, *toksōn* (Clouston 1959: 20).

17. Tk **žūř* (Mudrak) = **jūř* (traditionally) “100” resembles MKor *'yərĥ* “10” (Lee) = *jōr* “10”, *jōrōh* “a big quantity, number” (Starostin) // OJp *yōrōdu* “10 000”; pMo **yersūn* “9” may also belong here (see # 27); if it is etymologically connected with WrMo *yerü* “the most of ..”, *yerüdügen* “generally, for the greatest part”, *yerüŋkei* “common; public” (Ramstedt 1982: 62), the original meaning could have been **“the greatest [number]”* (cf. # 27). This semantic reconstruction remarkably corresponds with the reconstruction **jüz-on* (= **žūř-ōn* after Mudrak), proposed already by Ramstedt 1907: 19 (cf. # 52). Starostin, Dybo & Mudrak 1995, n. 265 reconstruct pAlt **jErV* **“a big number”*, i.e. **yeřü* in our notation, taking in account also the Mongolian data.

Miller 1971: 211–215 derives Tk “100” from pAlt **dū-r*₂, lit. “tens”, and compares it with Tg **žuwan* “10” < **dūwan* (not explaining **d-*) and OJp *tōwō* “10”. Menges 1968b: 97 presents a comparison of Tk “100” with Dravidian **nūzu* “100”, deducing pAlt **ñūri*/**ñürü*.

Mongolian numerals (modified after Poppe 1955: 242–250; Anderson 1982: 44, 47)

1 **niken* > Ancient Mo, MMo *niken*, Daghur *nike*, *neke*, Shirongol-Wuyangpu *nike*, Mogol *nikān*, besides WrMo *nigen*, Khamnigal *nege(n)*, Urdu *nege*, Kalmyk *negp*, Monguor *nige* etc., and WrMo *niji-ged* “each one”; cf. also a modern Chinese reading *nai* of the Khitan gloss “1” (Starikov 1982: 149). But Doerfer 1992: 48 connects it with WrMo *naj* “sehr”.

2 **qowī-ar* > MMo, WrMo *qoyar*, Khamnigal *koir*, Daghur *xo(y)ir*, Khalkha *xoyor*, Mogol *qoyōr*, etc., cf. **qo()r-in* “20” > MMo, WrMo *qorin*, Khamnigal *kori(n)*, Monguor *xorin/m* etc. “20”; the archetype **qoyar* > WrMo *qoyor(undu)*, Urdu *χōrondu* “between” continues also in Shira Yogur *qur*, Kachug Buriat *χōr*, San chuan *qor*, Monguor *gōr* etc. “2”; cf. also a modern Chinese reading of the Khitan gloss *χə*, *χo* “2” (Starikov 1982: 125). Vladimircov 1929: 276 adds WrMo *qobu-sun* “two-years-old boar” < **qowu-* and Oirat (Bayit) *xōi-mstā* “two-years-old” < **qoyī-* < **qowī-*.

**ži()r-in* > MMo (Secret History) *jirin*, WrMo *jiren* “two (about women)”; Monguor *žūr*, Daghur *žūr(ūr)* “pair” < **žirū(gū)* (if these forms are not borrowed from Solon *žūr* “2” — see Todaeva 1986: 145), cf. also WrMo *žitüger* “the second wife in a bigamous family” vs. *žitüge* “competition”; *jöbe-ger* “one of two”, Urdu *žöwōr*; WrMo *žirmusun* “pregnant” (cf. *dabqur* “double” & “pregnant”); Wr Mo *jiči* “again” vs. *jiči* “great-grandson” = “descendant of the second generation” — cf. *yuči* and *döči* for the third or fourth generation of descendants — see Kotwicz 1962: 138–139; (Poppe 1955: 243–244; Ramstedt 1957: 65; Poppe 1960: 28; Starostin 1991: 33 reconstructs pMo **žiw-rin*).

3 **γur-ban* > WrMo *yurban*, MMo *yurban* & *qurban*, Shira-Yogur *gurban*, Shirongol-Punan *gurbon*, Mogol *yurbōn*, Monguor *gurān* etc., cf. **γurtin* “30” > WrMo *yučīn*, Shira-Yogur *gučōn*, Khamnigal *guci(n)*, Monguor *xofin* (an influence of *xorin* “20”) besides WrMo *γu-tuyar* “3rd”, *γuriyu* “three-fingers-wide” and *γunan* “three-year-old animal”, Kalmyk *gürmṣṣṣ* “dreifädiges Seil” < **γurmasun* etc. (Ramstedt 1907: 8).

4 **dör-ben* > WrMo, MMo *dörben*, Shira-Yogur, Shirongol-Punan *durben*, Monguor *diēran*, Dungsang *žieruan*, Daghur *dureb*, *durben*, *durbun* etc., cf. **dörtin* “40” > WrMo *döčīn*, Shira-Yogur *dyučōn*, Monguor *tiefin* (*t-* after *tayin* “50”), besides WrMo *dö-töger* “4th”, *dörigü* “four-fingers-wide”, *dönen* “four-year-old animal” and probably *debger* “four-edged, quadrat” (Golstunskij) vs. *tebger* (Kowalewski) in spite of skepsis of Ramstedt (1907: 7).

5 **tawu-[ya]n* > Khitan *taw* (Starikov 1982: 148; Doerfer 1992: 49), WrMo, MMo *tabun*, Khamnigal *tabu(n)*, Shira-Yogur *tabyn*, Monguor *tāwēn*, Dungsang *tavuan*, Shirongol-Punan *tà'ŋ* (the unique -ŋ and the final -uan in Dungsang can reflect the expected *-u-yan as in Dungsang *žyguan* “6” < **žiryuyan*) etc., cf. WrMo *tabin*, Shira-Yogur *tabyn*, Khamnigal *tabi(n)*, Monguor *tayin*, Shirongol-Punan *ta' ŋu-ran* (-ran is a suffix common for the tens 30–90) “50”, besides WrMo *tab-tayar*, *tab-tuyar* “5th” and *tuulan* “five-year-old” < **tawlan* (Vladimircov 1929: 259).

6 **žiryu-yan* > WrMo *žiryuyan*, MMo *žiryo'an* ~ *žirwa'an* (Secret History), *žirqo'an* (quadrat script), *žiryu'an* (Muqaddimat), Monguor *žirgōn*, Shirongol-Punan *žirgon*, Dungsang *žyguan*, Shira-Yogur *žurgon*, Khamnigal *žurgaa(n)* etc., cf. WrMo, Monguor *žiran*, Khamnigal *žira(n)*, Šira-Yogur *žiren* etc. “60”.

7 **dol(u)-yan* > WrMo *doluyan*, MMo *dolo'an*, Monguor *dolōn*, Khamnigal *doloo(n)*, Daghur *dolō(ŋ)*, Shira-Yogur *dolon*, Shirongol-Punan *tolun* etc., cf. WrMo, Monguor *dalan*, Khamnigal *dala(n)*, Shira-Yogur *talán*, Shirongol-Wuyangpu *talyan* (cf. *nayan* “80”) “70”. Poppe 1955: 246 reconstructs pre-Mongolian **daluyan* with -a- after *dalan* “70”.

8 **nayi-man* > WrMo *nayiman* (cf. Vladimircov 1929: 283; Poppe 1938: 66 quotes the form of dat.-loc. in Quadrat script *nayiman(a)*), *naĭman* (after *nayan* “80”), MMo *naĭman*, Khamnigal *naima(n)*, Daghur *nayma(ŋ)*, Dungsang *niaman*, Shira-Yogur *nayman*, Shirongol-Punan *niyman*, Monguor *nēman* etc., cf. WrMo, Monguor, Shira-Yogur *nayan*, Khamnigal *naya(n)*, Daghur *naya(ŋ)* etc. “80”. E. Hamp 1970: 193 reconstructs **nayN-ban*, while Janhunen 1993: 177 proposes **nai-paln*.

9 **yersün* > WrMo *yesün* (older) ~ *yisün*, MMo *yisün*, Baoan *yirsən* (Kara 1990: 334), Shira-Yogur *isun*, Daghur *yise(ŋ)*, Khamnigal *yvxv(n)*, Monguor *šžen*, Shirongol-Wuyangpu *rsyn*, Dungsang *jesun*, Khalkha *yésseŋ* etc., cf. WrMo *yerén*, MMo *yiren*, Monguor *yerin*, Khamnigal *yere(n)*, Shirongol-Wuyangpu *iryń*, Shira-Yogur *iren*, Daghur *yure(ŋ)* etc. “90”. Krippes 1991: 148 adds Khitan *ši*, a tentative reading of the ideogram “9”; Starikov 1982: 151 quotes *is* after Chinggeltei, Doerfer 1992: 49 offers the reading *yisə*, while the modern reading of the Chinese gloss is *sin* (Starikov 1982: 118). Poppe 1955: 246 reconstructed pMo **yersün*, followed by Hamp 1970: 195 (**yir(s)*-), while Miller 1971: 237 prefers the distinction: sg. **yis-* vs. pl.-du. **yir-*. Pritsak 1954: 245 proposes that the suffixes *-*sün* and *-*en* indicated singular and plural respectively.

10 **[ø]ar(-)ban* > WrMo, Khamnigal *arban*, Buriat *arbaŋ*, Mogol *arbōn*, *arbān*, MMo *harban*, Shira-Yogur *xarban*, Daghur *xarba(n)*, *hareben*, *χarwaŋ*, Monguor *xar(w)an*, Dungsang *haruan* etc.

100 **žay/wun* > WrMo *žayun*, MMo *ža'un*, *ža(w)un* (Istanbul voc.), Daghur *žau*, Monguor *žiōŋ*, Shira-Yogur *juun*, Khamnigal *žoo(n)*, Shirongol-Wuyangpu *jon* etc., cf. also Khitan *žau*.

Comparative-etymological analysis

18. Mo **ni-ken* “1” is probably extended by the same (=diminutive) suffix as WrMo *üčüken* “little, few” or MMo *ke’üken* “child” vs. *ke’ün* “son” (Poppe 1955: 239). Analogically in some Tungus languages the numeral **ämün* “1” has been extended by the diminutive suffix **-kän* / **-kän*, e.g. Evenki *emükēn* vs. *emün* “1” etc. (Benzing 1955: 58–89; TMS II: 270). Ramstedt 1907: 4 & 1957: 65 derived **ni-* from the root attested in WrMo *nej* “together, unity” (Vladimircov 1929: 286; cf. Kalmyk *nī* “unity, agreement, harmony” — Ramstedt 1935: 277), *neyide*, *neyite* “together”, *neyile-* “to unite, unify”, *neyigen* “equal, identical”, Kalmyk *nīkq* “equal”, MMo (1389) *neyide* “ensemble, en commun” (Lewicki) etc.

Independently Ramstedt (1907: 5) noticed that formally comparable Kara-Kyrgyz *jekā* “alone, sole” and Chagatai *jāk* “one”, *jākā* “alone” represent probably borrowings from Modern Persian *yak* “one” (Räsänen 1969: 195).

The closest extra-Mongolian parallel appears surprisingly in Nivkh **ni* “1” (Panfilov 1973: 9).

19. Mo **qowī-ar* “2” is probably an innovation. Its etymology is uncertain. Ramstedt 1907: 5–6 reconstructed pMo **qoyir* on the basis *qoyiryu* “zweifelnd, unentschieden” (cf. also *qoyiy* ~ *quyiy* “peninsula” ?), seeing in the final *-r* a suffix comparable with *-r* separable in *küči* “strength” vs. *küčir* “heavy” or *möči* “limbs” vs. *möčir* “branch”. The stem **qoyi-* is compared with WrMo, MMo *qoyina* “after, behind” (Poppe 1955: 79), *qoyitu* “der Hintere” (Ramstedt l.c.), starting from the opposition Tg **ämün* “1” : Mo **qoyir* “2” = Mo *emüne* “in front, before” : Mo *qoyina* “after, behind”. Vladimircov’s reconstruction **qowī-* is compatible with WrMo *qubi* “part”, *qubiya-* “to divide”, *qubil-* “to change the appearance, take another shape” (Poppe 1955: 32) // Tg **xöbü-* “part” (TMS I: 403). Miller 1996: 116 adds still NKor word *kai* used in so called ‘Four-Stick’ game in the meaning “2”.

The only hopeful extra-Altaiic parallels appear in Yukaghir **kuj-/kij-* “2”, cf. Chuvan *kuyen*, *kuyun* “2” & *imoxanbo kiyon* “7” (Boensing), North Yukaghir **kij-* “2” etc. (Tailleur, *UAJb* 34 [1962]: 70), and perhaps in FU **koj-m[on]Vš* “20” (UEW 224–225), where the second component associated with the meaning “10” implies the meaning “2” for the component **koj-*.

20. Mo **ži()r-in* “2” and WrMo *jöbe-ger* “one of two” have cognates in Tg **žöwä(-r)* “2”, MKor *tur-h* “2” (Ramstedt 1957: 65) and perhaps OJp *ture* “companion” (Martin, *Lg* 42[1966]: 245). Ramstedt (1949: 275) added Tk (Mahmud al-Kašgari) *tükä* “a calf in the second year”. But there are at least comparably hopeful parallels in Teleut *tüŋ* “pair, similar”, Lebedin *tügäj*, Barabin *tüäj* “paarig” (Räsänen 1969: 505) and perhaps also Tk **dür* > Uygur *tüz* “gleich, gleichmässig, eben, vollkommen”, Turkmen *düz* “eben, glatt, ger-

ade”, Chuvash *tür* “eben” etc. (Räsänen 1969: 508; Dybo 1991: 59; Mudrak 1993: 68; Starostin 1991: 13 compares Tk forms with MKor *čřř-tá* “to keep straight on”, reconstructing pAlt *č-; Budagov has also recorded the meaning “even (number)”, see Sevortjan II: 310), if the segmentation *dū-ř is plausible. The quoted forms can be projected in pAlt *töwi or *tüwi “2; pair”. The further development could have been approximately as follows: *töwi > pre-Mo-Tg *döwi > *diöwi (-är) > Tg *žöwār and Mo *ži(w)ir- besides *žöwe- > *jöbe-(ger)* (see the rule 7). Starostin 1991: 33 reconstructs pAlt *diüwV “2”. Let us repeat the set of responses among dentals postulated by him (1991: 21):

rule	pAlt >	Tk	Mo	Tg	Kor
6.	*t'-	*t-	*t-	*t-	t-
	*ti-	*ti-	*či-	*či-	
7.	*t-	*d-	*d-	*d-	t-
	*ti-	*di-	*či-	*ži-	
8.	*d-	*j-	*d-	*d-	t-
	*di-	*ji-	*ži-	*ži-	
cf. also 18.	*č-	*d-	*d-	*ž-	č-
	*či-	*di-	*ži-	*ži-	

Mo & Tg *ž- and Kor t- imply Tk *j- (= *ž- according to Mudrak; series 8). The only candidate could be the Tk numeral “7”, traditionally reconstructed *jātti, accepting the semantic motivation “the second (after five)” (see Hamp’s analysis of Tk “70”). Tk *d-, Tg *ž- and Kor t- imply Mo *či- according to Starostin, but there is Mo *žirin “2” (but the parallel series 18 also implies Mo *ži- in the series 7). The main argument for the palatalized series (7) is based on the problematic etymon “stone”: Tk *dltāl = *tiāl (Mudrak) = *tjalja (Doerfer) // Mo *čilayun // Tg *žola // MKor *tōrh (Starostin 1991: 119). The external parallels (Kartvelian *tal- “flintstone” — see Illič-Svityč, *Étimologija* 1965: 343) confirm the originality of pAlt *t'- > Mo *t-/*či-, but not Tg *d-/*ži-. The Mo > Tg borrowing proposed by Poppe (1960: 77) looks as a plausible explanation. An alternative possibility is represented by the solution separating Tg *žola “stone” (& *žal-, TMS I: 247) from the other Altaic denotations of “stone”, and by finding a hopeful cognate in Tk: Turkish (dial.), Koibalsan *jalym* “rock”, Turkish (dial.) *yalın* “stone, high rock; bare”, Osman *jalman* “the summit of the mountain resembling an edge” (Sevortjan IV: 103), indicating an original pAlt *ž-. On the other hand, the external cognate for the numeral “2” reflected in IE *dwo-H₁ (Illič-Svityč l.c. 338, accepted even by Starostin 1991: 33) implies pAlt *t- and not *d-, reconstructed by Starostin. On the basis of these arguments the palatalized series 7 should have been modified as follows:

Alt *ti- > Tk *di- // Mo *ži- // Tg *ži-

21. Mo **yur-ban* “3” and **yuriyu* (> Kalmyk *gürü* “drei Finger breit” — Ramstedt 1935: 155) with a further suffixal extension can perhaps be derived from WrMo *yaur, yur* “Handwurzel, Handgelenk, Unterarm” (Ramstedt 1935: 157), although the semantic motivation remains puzzling (three joints of the arm: wrist, elbow, shoulder?). There are only hypothetical traces of external cognates, but their interpretation is not unambiguous. Miller 1971: 236–237 sees in OJp *kökönö* “9” a multiplication “3x3”, isolating here the root **kö* “3”, cf. Mo **žir-yu--yan* “6” = “2x3”. He also adds Kor *ilkop* “7”, analyzing it as *yər* “10” — **yu* “3” — *əp(s)* “be nonexistent”, i.e. “7” = “10–3” (1971: 244). Later he finds a more convincing correspondent of Mo *yur(-ban)* “3” in NKor *kōl* meaning “3” in so called ‘Four-stick’ game (1996: 116).

There are also promising external cognates: Fenno-Ugric **kurmi* “3” (UEW 174; Sammallahti 1988: 543), continuing in Hungarian *három*, pMansi **kuurem*, while **-l-* in Fenno-Permian **kolmi* and pKhanty **käälem* is explainable by the influence of the following numeral **neljä* “4” (Collinder 1965: 145). The bare root **kur-* is probably extended by the **-m-* suffix of abstract nouns, i.e. **kurmi* = “Dreiheit”. The old comparison of the FU “3” with Samoyed **nākūr* “3” (Helimski, *JSFOu* 81[1987]: 77; Janhunen 1977: 99 reconstructs **nākājr*) proposed by Castrén 1854: 194 is in principle also possible. The segmentation **nā-kur* allows to connect both FU **kur-* and Samoyed **-kur*. The component **nā-* can be identified with the element **nā-* forming some postpositions, e.g. **nāŋ* “zu” (dat. sg.), **nānā* “bei” (loc. sg.), **nātā* “von” (abl. sg.), **nān-mānā* (pros. sg.) (Janhunen 1977: 99).

Bouda 1952: 25–26 compared FU “3” with Chukchi-Koryak **kuryr* > Chukchi *krym-qor*, Koryak *kyjym-qoj* “dreijähriges weibliches Rentier”, cf. *qora & qoja* “Rentier” (cf. Mo *yunan* “three years old”).

It remains to explain the final component *-ban*. The suggestive parallel *-ben* in Mo *dör-ben* indicates their common origin. Hamp 1970: 194 tries to identify the doublet *-ban/-ben* with the reflexive-possessive suffix attested in WrMo *-ban/-ben* (after final vowels) and *-iyan/-iyen* (after final consonants) (Poppe 1955: 233). Etymologically, the Mo reflexive suffix is related to Tg **mēn* “(one)self”, MKor *móm* “body; person; self” and perhaps OJp *mono* “thing, method, being” (Ramstedt 1949: 151; Poppe 1955: 231; TMS I: 568; Starostin 1991: 280 reconstructs pAlt **māni*). Blažek, *ArOr* 58[1990]: 209 proposed a connection with the Nostratic denotation of “man, human being” attested in AA **manilu* // IE **manu-l*monu-* // FU **mānce* // Dravidian **man* (Illič-Svityč 1976: n. 292). Concerning the semantic development, cf. French *on* < *homme* or Tg **beje* “man; body” > “oneself” (TMS I: 122–123). But the distributive differentiation depending on the termination in vowel or consonant is just opposite than in the case of the analyzed numerals. Ramstedt 1907: 8 reconstructed pMo **yur-man* “3” & **dör-men* “4” besides the attested *nayiman* “8”. Later he connected this suffix with Kor *mān* “hand”, *mandi-* “finger, mit Händen betasten” (1982: 106). Perhaps a more hopeful candidate could be Kor *mān* “size, amount, number”, compared by Ramstedt 1982: 105

with the NTg suffix **-mān* forming multiplicative numerals (Benzing 1955: 106). Finally there are also promising properly Mongolian examples, which could form the suffix **-man* & **-men*, namely Dungsang *man* “all” (Todaeva 1961: 128), Daghur *mani* “group” (Martin 1966: 249). The hypothetical collective function of the suffix has an analogy in OJp numerative *-tu*, which is compared with Nanai *-tol-tu: ilan-to* “all 3”, *duyin-tu* “all 4” etc. (Avrorin 1959: 237; Menges 1975: 92).

22. Mo **dör-ben* “4” is extended by the same suffix as the numeral “3”. The root **dör-*, attested also in **dörtin* “40”, has cognates in Tk **dört* (Dybo) // Tg **dujgin* // pJp **də-* “4”, see Tk “4” discussed above. Miller 1996: 116 adds early MKor *towi* recorded in Japanese syllabic script (see # 46). Kalmyk *dörü* “vier Finger breit; четверть”, reflecting **dorigü* (similarly *gurü* “drei Finger breit” < **yuriyu* — see Ramstedt 1907: 7 and 1935: 99, 155), is terminated by a suffix comparable with OTk *törtägü* “four together” (Clauson 1959: 29; Kononov 1980: 114). If we accept this identification including the function of the suffixal extension, it is possible to connect the root **dör-* with Kalmyk *dörö* “Treppe, Erhöhung” < **döre* and Evenki *dörä* “Hügel” (missing in TMS; quoted after Ramstedt 1935: 99). The primary meaning could be extrapolated **“knuckles [of a hand] together”* > “four”. This conclusion agrees very well with Turkic data, where Chuvash *türt* “Rücken” in the idiom *alä türt-ěšě* “Handrücken” (Egorov 1964: 266; Doerfer, *OLZ* 66[1971]: 338) suggests a very similar primary semantic motivation.

23. Mo **tawu-[ya]n* “5” has been compared with various Altaic etymons:

(a) Tg **[i]tuŋga* “5” // MKor *tāsās* // Koguryō *utu* // pJp **itü-* “5”, cf. also Old Bulgarian **etə* “5” (Mudrak) and the puzzling Chagatai *ittik* “50” discussed above (Tk “50”) — see Starostin 1991: 70, reconstructing pAlt **tʰa(u)* while Vovin 1994: 106 proposes pAlt **itʰV*.

(b) Jp *taba* “handful, bunch” (Miller 1971: 233). Ramstedt 1907: 12 connected the Mo numeral “5” with WrMo *tabay* “sole (of the foot)” // Tk **tāpan* id. (cf. Räsänen 1969: 462; Starostin 1991: 118f reconstructs Tk **d-* and assumes Mo *tabay* < Tk dim. **dāpan-ak*) and also Teleut *tabaš*, Barabin Tatar *tabac* “Handfläche, hohle Hand”.

(c) WrMo *taba* “sufficiency” (Hamp 1970: 193).

(d) OJp *tōwo* “10” (Ozawa, cf. Miller 1971: 233).

There is again a very suggestive parallel in Nivkh *tʰo* “5” (Panfilov 1973: 9).

24. Mo **žiryu-yan* “6” has a transparent internal structure recognized already by Schott 1853: 11, cf. also Ramstedt 1907: 13–14 and Miller 1971: 221, 237, 240, namely **žir-* & **yu[r-]* “2 x 3”. The comparison of Mo “6” with Tg **ningun* “6” (Poppe) (see Ramstedt l.c., Poppe 1960: 28, 88, 130 and Miller 1971: 240) must be rejected. The correspondence Mo **ži-* // Tg **ni-*, based esp. on the comparison of WrMo *žiru-* “to draw” // Tg **niru-* “id., to

paint" (Poppe 1960: 28), is not valid. Starostin 1991: 117f, fn. 7 has separated two different roots here:

(1) Tk **d̄ir-ḡa-* "to scratch" // Mo *žiru-* "to draw" // Tg *žur(ū)-* "to scratch";

(2) Tk **jař-* "to write" // Tg **n̄iru-* "to draw, paint" // MKor *niru-, nir-k-* "to read".

25. Mo **dol(u)-ḡan* "7" has no unambiguous etymology. Janhunen 1993: 181 thinks that the presence of *-u- before suffix might well be due to the rhythmic analogy of the numeral "6". There are no traces of this vowel in Jurchen *dalhūn* "17" (Janhunen l.c.). Ramstedt 1907: 14 connected the numeral with WrMo *doluḡaburi* (*doluḡabur* by Golstunskij) "forefinger", Khalkha *Dolōwer* id. and the Mongolian borrowing in Koibalsan *tolamer* "ring-finger" (< **dolāwur*), identifying here the deverbal suffix *-buri*, extending the verb *doluḡa-* "to lick". He saw an analogy in Tk "7", deriving it from the verb "to eat" (see above). The semantic motivation "forefinger" = "lickfinger" or "eatfinger" is really known, cf. Greek λυχάνος, Lithuanian *ližius* or Shilha of Tazerwalt *māllay*, all "fore-finger" = lit. "lick-finger" — see Blažek, *ArOr* 66[1998]: 156.

An alternative solution can be a derivation from pAlt **čōlu* "full" > Tk **dōl̄* "full" : **dōl-* "to fill" // Tg **žalu-(m)* : **žalu-(p-)* id. // MKor *čāra-* "to be full, sufficient" // OJp *tar-* id. (Starostin 1991: 45, 129, fn. 89; Martin 1966: 243). The expected cognate in Mongolian would look ***dolu-* or ***dalu-* (cf. the response 18). This point of view agrees with Hartman (*KSz* 1[1900]: 155) who proposed that a parallel development can be assumed for Tk **jet-di* "7" (Hartman), deriving it from **jet-* "erreichen, genug sein", cf. e.g. Turkish dial. *yetiz* "all, whole, full" (Räsänen 1969: 199; Sevortjan IV: 193–194).

26. Mo **nay(i)-man* "8" represents a serious puzzle among Mongolian numerals. Ramstedt (1907: 17–18) is probably right, identifying the suffix *-man with the termination *-ban/ *-ben of the numerals "3", "4". The evident external cognates appear only in Manchu *niomere* "octopus", Udihe *ñumie* id. (TMS I: 645), which could, however, have been borrowed from some Mongolian source (Janhunen 1993: 178 quotes as a semantic parallel WrMo *naimalj̄in* "[eight-legged] crab").

Perhaps the identification of the root **nayi-* or **naj-* with MMo (1389) *naj* "au plus haut degré, très" (Lewicki 1959: 62) = (Secret History) relative adverb *nai* "sehr" (Haenisch 1939: 113) represents the most simply solution.

Hamp's reconstruction **nayN-ban* opens a possibility to connect the root **nayN-* with Tg **n̄ān* "again, once more" (TMS I: 633), Tk **janall/jene* "again", usually derived from **jan-* "to turn back" (Sevortjan IV: 115), and perhaps with Kor *nai-nai* "again and again" (Ramstedt 1949: 159). Hence "8" = "once more [four]"?

A hypothetical relationship of Mo **nay(i)-man* “8” with MKor *nəy-h* “4” implies an original meaning “4 x 2” for the Mongolian numeral. There are at least two possibilities: (1) The protoform is **nayi*, with a regular plural **nayin* (Poppe 1955: 175), extended **nayin + -man > *nayiman*. (2) The protoform is **nayil*, with a regular plural **nayid* (Poppe 1955: 179), extended **nayid + -man > *nayiman*. Esp. this second alternative opens a possibility to deduce pAlt **ñVl- *‘4*”, directly attested in Korean (# 46), indirectly in Mongolian “8” = “4 x 2” and Tungus “6” = “4 [subtracted from 10]” (# 35).

There are also extra-Altaiic parallels: besides Nivkh *nu-*, *ny-* “4” & *minr* “8” esp. FU **ñeljä* “4” & Ugric **ñalV* “8” (UEW 315–316; 875) and Dravidian **ñāl* “4”. Miller (1971: 233) sees in the Mo “8” an isolated innovation. Later he proposes a Tungus origin, reconstructing the following development: **zär-män* “2 [subtracted from] 10” > **när-män* > **najman* (Miller 1975: 148). Although this artificial construct has no support in any Tungus language, the idea of a foreign origin can be fruitful. There is Nivkh *minr* “8” with a transparent internal structure, cf. *mV-* “2” and *nu(r)* “4”, but the comparison with Mongolian “8” would presuppose a metathesis **ñVmr* (cf. Manchu *niomere* “octopus” ?!) and a following substitution of the final **-r > *-n*. On the other hand, Nivkh (Amur) *ñyñben* “9” (= **“one subtracted from [ten]”*); cf. *ñV-* “1”) resembles Mongolian “8” much more suggestively. The semantic difference remains unexplained. Perhaps, accepting the original semantics for “9” = “the greatest [number]” (see below), it is plausible to reconstruct the primary meaning **“one subtracted from the unit”*.

27. Mo **yersün* “9” can be segmented **yer-sün* or **yers-ün*. The first possibility offers to identify the second part with the nominal suffix **-sun/*-sün*. In the second case the final *-ün* resembles the genitive ending. The first part **yers-* is terminated in *-s-*, which could reflect the negative verb **ese*. If we accept the connection of the root **yer-* with WrMo *yerü* “the most of”, *yerüdügen* “for the greatest part, generally”, *yerüŋkei* “common”, the original meaning could be “the greatest [number]”. Ramstedt 1907: 18 confirms that the number “9” is understood as a special unit among Mongols. The alternative segmentation **yer-s-* can be interpreted as “the great number without [one]”. It was already Gombocz (*KSz* 13[1913]: 11–12) who compared Mo “9”/“90” with Tk **jūr* “100”, perhaps reduced from **jūr-ōn* “the biggest ten” (cf. Ramstedt 1907: 19). The other cognates are MKor *jörśh* “a big quantity, number”, *jör* “10” (Starostin) = *yər* (Lee) and OJp *jörò-du* “10.000” (Ramstedt 1982: 62; Syromjatnikov 1981: 73; Starostin, Dybo & Mudrak 1995, n. 265).

28. Mo **parban* “10” has no convincing etymology. Ramstedt’s attempt to connect it with WrMo *arba-* “sich spritzen”, Kalmyk *arwā-* “sich aufrecht stellen, sich in allen Richtungen strecken (Finger, Zweige), sich sträuben (Haar, Blätter)” (1907: 21) is doubtful semantically and also phonetically. Poppe (1960: 87) compares Mo *arba-* with Manchu *arbutun* “Gebärde” and

Evenki *arpul-* “winken”, excluding so the original pMo **φ*- ~ Manchu *f-* & Evenki *h-*. Ramstedt (1907: 9) also quoted Moghol *arbōn* “10; mehrere, viele; einige” but it represents more probably a contamination of the numeral “10” and Wr & MMo *arbin* “reichlich” without any traces of *h-* in MMo or Evenki (cf. *albigū-* “vergrössern”, see Poppe 1960: 87). Phonetically a more plausible correspondent could be MMo (Secret History) *har*, WrMo *ar* “muster, ornament, figures” (Ramstedt 1949: 185); cf. also Tg **orō* “picture, ornament” (TMS II: 20) vs. Tk **ōn* “10” (# 10).

29. Mo **ʒay/wun* “100” has the most convincing cognate in Tg **ʒuwan* “10” (Ramstedt 1907: 22; Id. 1957: 67). Concerning the correspondence in vocalism, cf. e.g. Mo **dayu-s/-* “to finish” vs. Tg **duwē* “end” (TMS I: 218). Ramstedt 1949: 77 connects the Tg form with Manchu *ʒuwan-* “to open the mouth, come loose”, supposing an original meaning **“open [hand]”*. But the original meaning of this Tg verb was “to yawn” (TMS I: 281). The other etymological attempts are also problematic: Kor *čjuŋ* “all (of number)” (Ramstedt 1982: 42 compared it with WrMo *čöm* “all”) or Kor *čoi* “all, altogether, entirely” (Ramstedt 1982: 38 compared it with Oroch *čupali* and Mo *čo(γu)* “all”).

Tungus numerals

Probably the only systematic reconstruction of the Tungus numerals was presented by J. Benzing (1955: 26, 101–103), including a tentative projection on a more archaic level. Let us compare them with the alternative reconstructions of Starostin (1991: 213, 33, 141):

	Benzing		(North)	(South)	Starostin
1	* <i>āmūn</i>	< ** <i>ām-gūān</i>			1 * <i>emū-n</i>
2	* <i>ʒōr/ʒūār</i>	< ** <i>ʒi-gūā-r</i>	20	* <i>ʒōr-ʒ[uw]an/r, -miar</i>	2 * <i>ʒuwe-r</i>
3	* <i>īlan</i>	< ** <i>ī-guan ?</i>	30	* <i>īlan-ʒ[uw]an/r, -miar etc.</i>	3 * <i>gutīn < Mong</i>
4	* <i>dūgūn</i>	< ** <i>dūr-gūān</i>	40		4 * <i>dā[s]in < Mong</i>
5	* <i>tuŋga</i>		50		5 * <i>susai</i>
6	* <i>hōŋūn</i>	< ** <i>hōŋ-gūān</i>	60		6 * <i>hōŋūn/r-ʒu(a)</i>
7	* <i>nadan</i>	< ** <i>nad-guan ?</i>			7 etc.
8	* <i>ʒapkun</i>	< ** <i>ʒap-kuan</i>			8 * <i>ʒa-pku-n</i>
9	* <i>xūyāgūn</i>	< ** <i>xūyā-gūān</i>			9 * <i>xegū-n</i>
10	* <i>ʒuwan</i>		100	* <i>hāmā</i>	10 * <i>ʒuwa-n</i>
	Even * <i>mūan</i>				

There are remarkable facts of the oldest records leading to important corrections of some archetypes. The oldest written Tungus language is Jurchen (12th–16th cent.). The Jurchen numerals are transcribed in various ways (Janhunnen 1993, Mudrak 1985, Miller 1975, Menges 1968a):

	Jurchen		Manchu		Jurchen				Manchu
	Mudrak	Menges			Janhunen	Mudrak	Miller	Menges	
1	<i>emu</i>	'o-mu	<i>emu</i>	11	<i>omfo[n]</i>	<i>omslo</i>	<i>omšo</i>	'an-fo	<i>omšon</i> "11th month"
2	<i>fuwe</i>	<i>fo</i>	<i>fuwe</i>	12	<i>jurhūn ></i> <i>jurhūn</i>	<i>firxwan</i>	<i>fir-xuan</i>	<i>fi-r/ŋ-ɬuan</i>	<i>forxon</i> "12th month"
3	(<i>jilan</i>)	<i>i-lan</i>	<i>ilan</i>	13	<i>gōrhūn</i>	<i>gorxwan</i>	<i>γuor-xuan</i>	<i>gūo-r/ŋ-ɬuan</i>	
4	<i>dujin</i>	<i>du-jin</i>	<i>dujin</i>	14	<i>durhun</i>	<i>durxwan</i>	<i>dur-xuan</i>	<i>du-r/ŋ-ɬuan</i>	
5	<i>šunža</i>	<i>šun-ža</i>	<i>šunža</i>	15	<i>tofūhūn</i>	<i>tobuxwan</i>	<i>to-bu-xuan</i>	<i>to-ɬu-ɬuan</i>	<i>tofoxon</i> "15; 15th day of month"
6	<i>niugžu</i>	<i>niŋ-žu</i>	<i>niŋgun</i>	16	<i>niłhun</i>	<i>ni[ŋ]un</i>	<i>nīl-xon ></i> <i>ni-xun</i>	<i>ni-ɬun</i>	<i>niolxun</i> "16th day of the 1st month"
7	<i>nadan</i>	<i>na-ɬan</i>	<i>nadan</i>	17	<i>dalhūn</i>	<i>daRxwan</i>	<i>dar-xuan</i>	<i>da-r/ŋ-ɬuan</i>	
8	<i>ža(h)kun</i>	<i>ža-kun</i>	<i>ža-kū</i>	18	<i>niohun</i>	<i>niuxun</i>	<i>ɬū-xun</i>	<i>nju-ɬun</i>	
9	<i>hujehun</i>	<i>wu-je-wēn</i>	<i>ujun</i>	19	<i>oniōhūn</i>	<i>oniuxwan</i>	<i>oɬū-xuan</i>	<i>wo-nju-ɬuan</i>	
10	<i>žuwa</i>	<i>žua</i>	<i>žuwan</i>						

The tens are in a full agreement with the South Tungus pattern reconstructed above:

20	<i>horin</i>	<i>wo-lin</i>	<i>orin</i>	50		<i>susaj</i>	<i>su-sə-ji</i>	<i>susaj</i>
30	<i>gučin</i>	<i>gu-šen</i>	<i>gusin</i>	60		<i>ni(u)ŋžu</i>	<i>niŋ-žu</i>	<i>niŋžu</i>
40	<i>dexi</i>	<i>te-ɬi</i>	<i>dexi</i>	70		<i>nadanžu</i>	<i>na-ɬan-žu</i>	<i>nadanžu</i>
				80		<i>ža(h)kunžu</i>	<i>ža-kun-žu</i>	<i>žakūnžu</i>
				90		<i>hujehunžu</i>	<i>wu-je-wan-žu</i>	<i>ujunžu</i>
				100		<i>tangu</i>	<i>taŋ-ğu</i>	<i>taŋgū</i>

During the 18th and early 19th cent., the first records of non-literary Tungus languages appear:

	Lamut = Even				Oxotsk		Aldan	Kamchatka Bay
	Witsen 1705				Pallas 1787	Bilings / Saryov 1811	Erman 1848	Messerschmidt / Strahlenberg 1730
1	<i>omun</i>	11	<i>omun-ɬian</i>		1	<i>umēn</i>	<i>omun</i>	<i>omokon</i>
2	<i>zur</i>	12	<i>zur-ɬian</i>	20	<i>dianɬialakan</i>	2	<i>dijur</i>	<i>d'giur / dgiur</i>
3	<i>ilan</i>	13	<i>ilan-ɬian</i>	30	<i>mugina-ɬian !</i>	3	<i>ilēn</i>	<i>ellēn</i>
4	<i>dagan</i>	14	<i>digin-ɬian</i>	40	<i>digin-ɬanɬialakan</i>	4	<i>dixin</i>	<i>dittan / ullān</i>
5	<i>toḡan</i>	15	<i>ɬiakon-ɬian</i>	50	<i>toḡan-ɬanɬialakan</i>	5	<i>toḡn</i>	<i>dægen / degen</i>
6	<i>niugun</i>	16	<i>nun-ɬian</i>	60	<i>nugun-ɬianɬialakan</i>	6	<i>nyuḡun</i>	<i>gedin</i>
7	<i>nadan</i>	17	<i>nōdan-ɬian</i>	70	<i>nadan-ɬianɬialakan</i>	7	<i>nyuḡun</i>	<i>d'galkun/dagalkun</i>
8	<i>ɬiabkan</i>	18	<i>ɬiabkon-ɬian</i>	80	<i>ɬiabkan-ɬanɬialakan</i>	8	<i>nadan</i>	<i>nadan</i>
9	<i>ylgin</i>	19	<i>ylgin-ɬian</i>	90	<i>yugnan-ɬanɬialakan</i>	9	<i>diapkun</i>	<i>tiupan</i>
10	<i>ɬian</i>					10	<i>digkabkan</i>	<i>uynin</i>
							<i>užul</i>	<i>men</i>
							<i>mēr</i>	<i>/ diaar</i>

	Tongusu-Konni	Evenki Barguzin	Oleni	Yenisejsk	Lower Tunguska	Chapogir	Upper Angara
	Strahlenberg	Pallas #146	Strahlenberg	AP	AP	Pallas #151	Pallas #147
1	<i>amka</i>	<i>umukōn</i>	<i>umun</i>	<i>ummukon</i>	<i>mükonn</i>	<i>umukon</i>	<i>umukōn</i>
2	<i>czivo</i>	<i>fyur</i>	<i>dziun</i>	<i>ɬjur</i>	<i>djuhr</i>	<i>omuk</i>	<i>fur</i>
3	<i>jelan</i>	<i>ilān</i>	<i>ilen</i>	<i>illūn</i>	<i>ilān</i>	<i>ilān</i>	<i>ityan</i>
4	<i>tuin</i>	<i>dygŋn</i>	<i>digin</i>	<i>diggin</i>	<i>dégenn</i>	<i>digin</i>	<i>digtin</i>
5	<i>guincza sic!</i>	<i>toḡá</i>	<i>tunya</i>	<i>nūḡja</i>	<i>tōḡa</i>	<i>tuḡa</i>	<i>tuḡá</i>
6	<i>niumu</i>	<i>nyugūn</i>	<i>nucun</i>	<i>njúḡun</i>	<i>nūḡun</i>	<i>nugun</i>	<i>nyūḡun</i>

	Tongusu-Konni	Evenki Barguzin	Oleni	Yenisejsk	Lower Tunguska	Chapogir	Upper Angara
	Strahlenberg	Pallas #146	Strahlenberg	AP	AP	Pallas #151	Pallas #147
7	<i>nadan</i>	<i>nádan</i>	<i>nadun</i>	<i>nádan</i>	<i>naddan</i>	<i>nadán</i>	<i>nadan</i>
8	<i>czachun</i>	<i>ǰapkún</i>	<i>ziapkun</i> "9" !	<i>dǰápkun</i>	<i>dǰápkull</i>	<i>ǰamkun</i>	<i>ǰapkún</i>
9	<i>unjun</i>	<i>yögin</i>	<i>giggín</i> "8" !	<i>jégin</i>	<i>ijóggín</i>	<i>yegin</i>	<i>tuggín</i>
10	<i>czuen</i>	<i>ǰáán</i>	<i>ziun</i>	<i>ǰjan</i>	<i>dǰánn</i>	<i>ǰan</i>	<i>ǰan</i>
20	<i>oren</i>	<i>orin</i>		<i>ǰjur-ǰjar</i>	<i>dǰuhr-jarr</i>		
30	<i>ceuzin</i>	<i>elan-ǰár</i>		<i>illán-ǰjar</i>	<i>ilann-jarr</i>		
40	<i>tanhi</i>	<i>dygin-ǰár</i>		<i>diggín-ǰjar</i>	<i>dégenn-jarr</i>		
50	<i>zuzei</i>	<i>toǰa-ǰár</i>					
60	<i>niumhu</i>	<i>nyugun-ǰár</i>					
70	<i>nadanzu</i>	<i>nadan-ǰár</i>					
80	<i>czanchunzu</i>	<i>ǰapkun-ǰár</i>					
90	<i>kunjuntu</i>	<i>yögin-ǰár</i>					
100	<i>tengun</i>	<i>nǰamáǰin</i>			<i>nemáǰje</i>		<i>nyama</i>

These forms lead to the modification of Benzing's reconstructions:

- 1 **āmün*
- 2 **ǰöwār*
- 3 **ǰl(V)lan* ?
- 4 **duj-gin*
- 5 **tu[a]nǰa*
- 6 **nölgün*
- 7 **nadan*
- 8 **ǰab-kun*
- 9 **xürä-gin*
- 10 **ǰuwan* & **mian*
- 100 **taǰū* & **námā(-ǰin)*

Comparative-etymological analysis

30. Tg **āmün* (Benzing) = **emū-n* (Starostin) = **emö-n* (Janhunen) "1" has been compared with WrMo *ebür* "Vorderseite, Süd, Südseite des Berges, Brust, Schoss", dat. *emüne* "vornen", Kalmyk *ömnö* "vorn, voran, nach Süden" (the alternation of *-r/-n-* suffixes also appears in other words, e.g. *dotur* "Innenseite" vs. *dotuna* "innen" or *ǰadar* "Aussenseite" vs. *ǰadana* "aussen"), cf. also WrMo *ebüče-* "vereinigen" (Ramstedt 1907: 5). Ramstedt 1949: 54 compared Manchu and Nanai *emuči* "the first" with Kor *emǰi*, isolated from *emǰi* — *sonkkäräk* "thumb" (*sonkkäräk* "finger"). Miller 1971: 230 and Murayama 1958: 229 and 1966: 154 add Jp *omo* "paramount" < OJp *ömö* "Gesicht, Vorderseite, Hauptsache". Jurchen **omšo[n]* "11" and Manchu

omšon “11th month” are more probably borrowed from Mo *onča* “special, separate, unique”, rather than inherited from Tg **ämün* “1” (Janhunen 1993: 172). The same origin is also evident for Solon *üš’un bé, umšón bé* “11th moon” (TMS II: 272) in contrary to Miller 1975: 151, who sees here the traces of Manchu “9”.

31. Tg **žöwä-(r)* “2”, originally perhaps **žöwi* “2” and **žöwi-är* > **žöwär* “pair”, corresponds to Mo **žirin* “2” (about women), WrMo *jöbe-ger* “one of two” and accepting the secondary palatalization (see Mo “2”) also to MKor *tür-h*, OKor **tubir ~ *tuwir* “2” (Starostin 1991: 33), OJp *ture* “companion”, Tk **düř* “equal”, **[d]üŋ* “pair. Cf. further Even *dudgun* “pair, couple”, Udihe *dogdi* “husband; wife” (TMS I: 219). Janhunen 1993: 173 thinks that Jurchen **žirhün* “12” represents rather a Mongolian import than a continuant of Tg “2”. But the reading **juwerhon* of Kane (1989, quoted after Janhunen) based on the Awanokuni manuscript is closer to the proto-Tungus archetype than to any Mongolian source.

Bouda, *UAJb* 25[1953]: 165 compares Tg “2” with Tamil *cōḍu* “pair”, isolated within Dravidian (cf. Menges 1977: 140). This comparison implies an originality of **ž-* or **č-* in the form preceding the numeral “2” in Tungus and Mongolian on the Altaic level. On the other hand, in that case the relationship of MKor *turh* “2” should be excluded.

32. Tg **ilan* “3” reconstructed by Benzing cannot be the archetype for some deviated forms: “Tongusu-Konni” *yelan*, Lamut (= Even) of Aldan *ilelan* (Billings), *ellan* (Erman), Lamut of Kamchatka Bay *ullan* (Strahlenberg), *ütan* ! (Messerschmidt). There are more hypothetical possibilities:

**ili-lan*, perhaps derived from Tg **ili-* “to stand” (TMS I:), if “3” was named after the “middle finger” = “standing out finger”; Ramstedt 1949: 167 derived it from the verb appearing in Oroch *il(i)ča-* “to bind a rope from three fibres”, but Orok & Nanai *sijl-*, Olcha *sjlü-* “to braid hair” signalize pTg **xili-* (Benzing 1955: 41; TMS I: 311);

**ul[i]-lan*, perhaps comparable with Tk **ül-* “to divide, distribute” (Räsänen 1969: 520). Sevortjan I: 628–629 connects it with Tg **il-* “to measure” (TMS I: 309);

**utlč(V)-lan*, the least probable protoform, comparable perhaps with Tk **ūč*;

**[ñ]ila-n* — the reconstruction proposed by Vovin (1993: 256) to compare it with MKor *sey(h)* & **-ñe[]i* “3”; cf. also MKor *nirkup* “7”, interpreted as “3 bent [fingers]” (Ramstedt 1949: 77, 167).

For some starting points even extra-Altaic (substratal ?) parallels can be quoted:

**yil[e-l]an* (cf. yet Sibio *jilači ~ žilači* “third” and the record *gilaŋ* from Amur attested by Gerstfeldt with *g-* = *y-* ? — see Schmidt 1933: 366) can be compared with Yukaghir (Tundra) *jalo-*, (Kolyma) *jalo-* “3” (predicative) (Ramstedt 1907: 9; Krejnovič 1982: 119);

*illa- resembles Eskimo (Mackenzie R.) *illa-k* “the third” (Thalbitzer, *JSFOu* 25/2[1908]: 22–23).

Jurchen *gorxwan* (Mudrak) = *gûrhûn* (Janhunen) “13” is undoubtedly of Mongolian origin (Janhunen 1993: 173–174; only Miller 1975: 146 speculated about Altaic heritage).

Lamut (= Even) *mugina-zian* “30” (*zian* = “10”) recorded by Witsen (1705) is absolutely unique within Tungus. Separating the formant *-gin(a)*, formally comparable with the termination of *yigin* “9”, *digin-zian* “19” etc., the root **mu-* can be connected with the meaning “3”. There is no hopeful inner-Tungus etymology (perhaps Olcha *mejen* “a space between two objects”, Evenki *muje* “edge” etc. — see TMS I: 551). On the other hand, the most attractive cognates appear in OJp *mi-* “3” = *myi-* (Martin), Koguryō **mit* (Miller).

33. Tg **dugin* (Dybo) = **dügin* (Starostin, Janhunen) = **dügün* (Benzing) “4” has cognates in all Altaic branches with the exception of Korean: Tk **dört* // Mo **dörben* “4”, **dörigü* “vier Finger breit”, **dörtün* “40” // pJp **də-* “4”. The loss of the expected *-r-* in Tg is probably regular in certain positions (Starostin 1991: 20–21, 91). The suffix **-gin* resembles the same suffix forming feminine nouns in Evenki (Benzing 1955: 76).

Manchu *durbe* “a dog with four eyes” and *durbežen* “tetragon” are borrowed from Mongolian (Ramstedt 1907: 7–8).

Jurchen *durhun* (Janhunen) = *durxwan* (Mudrak) “14” is also borrowed from some Mongolian source (Janhunen 1993: 174 in contrary to Miller 1975: 146, assuming a common Altaic heritage).

34. Tg **tuŋga* (Benzing, Starostin) = **tuŋga* (Janhunen) = *[*i*]tuŋga (Vovin) has usually been compared with Mo **tawu-[ɣa]n*, MKor *tasās*, Koguryō *utu* and OJp *itu-* “5”, cf. also Old Bulgarian **etə* “5” and puzzling Chagatai *ittik* “50” (see above Tk “50”). The reconstruction of Vovin (1994: 106 and *JSFOu* 85[1994]: 253) explains the initial **c-* > *s-* in South Tungus languages as follows: **ituŋga* > **t̥iŋga* > South Tungus **cuŋʒa*. This rather artificial reconstruction has the most important support (and maybe the main motivation) in OJp *itu-*, but there is even a hypothetical extra-Altaic parallel in Eškimo *itu-mak* “the palm of the hand” (Thalbitzer, *JSFOu* 25/2[1908]: 23). Benzing 1955: 31 proposes an alternative reconstruction **tungia* (cf. Evenki of Yenisejsk *tūŋya*) > *tunʒa* (Olcha) > *sunʒa* (Manchu) with the same distant palatal assimilation as in Tg **tārgān* > Manchu *sežen* (Tg **-rg-* > Manchu *-ž-* regularly). Poppe 1960: 73 compares Tg “5” (**tuŋā* in his reconstruction) with WrMo *toya*, MMo (Secret History) *to'a*, (Muqaddimat) *to'an*, *tōn*, Mogol *toa*, Dagur, Khalkha, Kalmyk *tō* “number” (Vladimircov 1929: 195, 214; Poppe 1955: 70).

This etymology can be significantly supplemented by Tg **tawun-* “to read; count”, continuing also in Oroch *taun* “every, all”, Udihe *tau(n-)*, Nanai

tao(n-) “every, all; number” (TMS II: 161–162). Adding Tg **niŋi* “finger” (Oroch *niŋi* id., Udihe *ni/niŋi* “a breadth of the joint of a finger”, see TMS I: 639), the compound **tawu(n)- & *niŋ-* or **tuwa(n)- & *niŋ-* “all fingers” or “a number of fingers”, gives finally **tu(a)niŋa(n)* “5” (the traces of the diphthong **-ua-* appear in Solon *tuŋán, tuŋēn* according to Ivanovskij — see TMS II: 214). Perhaps a similar structure can be identified in MKor *tasās* “5”, analyzed by Ramstedt 1949: 77, 258–259 as a compound of Kor *tā* “all, every one” and *son* “hand”.

Ramstedt (1949: 284; 1952: 65) proposed an alternative and very improbable solution, assuming a borrowing of Tg “5” from Sino-Korean *thoŋ* “all, the whole, collectively; a collection of five houses in census records”. His comparison of Manchu *sunža* “5” and Evenki *solto* “fist” (Ramstedt 1949: 241) must be rejected.

On the other hand, a similarity of South Tungus **susai* “50” and MKor *suyn* id. is very suggesting.

“Tongusu-Konni” *guincza* “5” (Strahlenberg) probably represents a wrong record of South Tungus **cunža*.

Lamut (= Even) of Kamchatka Bay *gedin* “5” is quite unique without any parallels within Tungus (Tg **geren* “all, many”? — see TMS I: 182), Altaic or non-Altaic neighboring language families. Let us mention that Strahlenberg was mistaken in determination of concrete values of numerals (only *omokon* means really “1”).

Lamut (= Even) *ziakon-zian* “15” after Witsen (1705) is also quite incomprehensible.

Jurchen *tobuxwan* (Mudrak) = *tofūhūn* (Janhunen) “15”, Manchu *tofoxon* “15; 15th day in a month”, Nanai *tookon*, (Sungari) *tovokon* “15” (Schmidt 1933: 366; Benzing 1955: 101) are undoubtedly borrowed from some Mongolian source (see a more detailed discussion in Janhunen 1993: 174–175, 180).

35. There are various reconstructions of Tg “6”: **nōŋjūn* (Benzing) = **nōngön* (Janhunen) = **nūgun* (Starostin, Vovin) = **niŋgun* (Poppe 1960: 130; he derived it from older **nirgun* to compare it with Mo *žirγuyan* — more in # 24). Just Poppe’s reconstruction allows to see here a derivative of Tg **niŋi* “finger” (TMS I: 639; cf. also Tg “5”). Identifying in the final *-gun* the suffix attested e.g. in Evenki *bi-kūn* “I great” (Sunik 1982: 106), the numeral can be analyzed **niŋgun* “6” < **niŋ-kūn* “[one] finger more” (Benzing 1955: 91 reconstructs **-kōn*). Schmidt 1933: 367 derived Manchu *nirgun* “6” (it implies that Poppe’s reconstruction is the most preferable) from Manchu *nirgu* “oberhalb” (TMS I: 598 “top, peak; zenith”), i.e. “6” = “[1] over [5]”.

Jurchen *nilhun* (Janhunen) = *nül-xon* & *ni-xun* (Miller) “16” and Manchu *niolxun* “16th day of the first month” cannot be directly derived from any Mongolian source. Janhunen solves it by postulating pMo **nil-* “6”, which had to be replaced by **žirγuyan* “6”, for its transparent internal structure interpreted as an innovation. But Janhunen himself admits a proximity of Tg “6”

and South Tg “16”, explainable as a common Tg heritage. If we accept this idea, the reconstructions **ñöl-gün* “6” and South Tg **ñol-xun* “16” are possible. The irregular development of the cluster **-lg-* (see Benzing 1955: 45 about regular responses) could be caused by the influence of the preceding numeral **tuñga* or perhaps by nasal assimilation **ñölgün* > **ñöjün* ? The development from **ñöl-žün* “6 [subtracted from] 10” is also in principle possible, cf. Oleni Evenki *nucun*, and Jurchen (Mudrak) *niujžu*? The root **ñöl-//ñol-* has no convincing internal Tungus etymology (Evenki *ñol* “big, large, great; rough” ? — see TMS I: 643; cf. also WrMo *neliyen* “much, enough, large”).

There are promising extra-Tungus parallels. OJp *mu-* “6” has been derived from **ñu-* (Starostin 1991: 78, 141; Vovin 1994: 106). On the other hand, this numeral can be derived by internal apophony from OJp *mi-* “3” — cf. the pairs 1 : 2, 3 : 6, 4 : 8 (Miller 1971: 237; Syromiatnikov 1981: 71; already Schott 1853: 11). Starostin 1991: 141 also speculates about a relationship of MKor *'yəs'is* “6”, assuming an early loss of **n-*. The second candidate could be MKor *nəyh* “4”. The loss of the expected **-r-* can be analogical to *səyh* “3” vs. *syərhin* “30” (Krippes 1991: 149 reconstructs pSilla **siri-k* & **siri-k-on*). The semantic difference “4” vs. “6” is also explainable, if we accept a subtractive model in Tg, i.e. 6 = [10] — 4. The form **ñöl-* “4” can represent an original Altaic numeral “4” with very attractive external cognates — in Fenno-Ugric **neljä* “4” (UEW 316) and Dravidian **nāl* “4” (Tyler, *Lg* 44[1968]: 807), while the most wide-spread form **dör[i]* “4” seems to be an innovation with the inner Altaic etymology (cf. ## 4, 22).

An indirect support of the original semantic structure of the numeral “6” is attested in Lamut (= Even) of Kamchatka Bay, where Messerschmidt and Strahlenberg recorded *d'egen // degen* “4” vs. *d'galkun // dagalkun* “6” respectively. If the element *-l-* reflects the ablative suffix **-lā-kī-*, this innovated numeral probably represents a subtraction “4 [subtracted] from 10” ?

With respect to the promising Chukcho-Koryak etymologies of the numerals “7” & “9”, a hypothesis of the same origin for “6” is not so heretic. In fact, there is a good candidate in Koryak (near Karaga Isl.) *nun-malan* “6” (= “1 + 5”) or Chukchi (Steller) *annyan-millgin* etc. (Anderson 1982: 32).

36. Tg **nadan* “7” is reconstructed quite unambiguously. The only rather deviated form *nadun* in Oleni dialect of Evenki (Strahlenberg) is explainable by the influence of *nucun* “6” and *ziapkun* “8”. The numeral has been compared with OJp *nana-* and Koguryō (Murayama) *nanun* “7” (Miller 1971: 242). Starostin 1991: 141 adds Tk **jätti* (< **jäddi* in his transcription) and MKor *nir-kup* “7”. Regardless of evident phonetic problems of this comparison, Starostin, Dybo & Mudrak 1995: n. 692 reconstruct pAlt **nad[i]*. On the other hand, Miller 1971: 242 assumes a borrowing from Mongolian, reconstructing the following, rather risky, development: pMo **daluyan* “7” > **laduyan* > **ladayan* > pTg **nadan* > pJp **nana-*. Regardless of this not too convincing

attempt, the idea of a foreign origin of the numeral from the interval 6÷10 without any promising internal etymology is doubtless fruitful. It is remarkable that the numeral "7" has been borrowed in more language families: Indo-European and Kartvelian from Semitic, Fenno-Permian from Baltic (or early Slavic according to Napol'skikh), Ugrian from Indo-Iranian (or Tocharian according to Napol'skikh), Samoyed from Tocharian, South Cushitic from Bantu, East Cushitic from some Nilo-Saharan source (Surma ?), etc. Consequently it is quite legitimate to seek some non-Altaiic neighboring or substratal donor-language. One candidate is certainly the Nivkh language, a substratum for the Tungus languages from the basin of lower Amur. But the form *ŋamg* "7" cannot be a source of the Tg **nadan*. Similarly Yukaghir, a substratum for some northern Even dialects, can be excluded (cf. Tundra *puskij-*, Kolyma *purkij-*, orig. "2 over [5]", where *kij-* = "2", Kolyma *pure-* "top", see Krejnovič 1982: 114). The last candidate, Chukcho-Kamchatkan, represents probably the oldest recognizable stratum preceding the Tungus languages. Burykin 1984: 20–23 collected more Tungus etymons without Altaic cognates but with hopeful Chukcho-Koryak parallels. And really, in Koryak (Pallas) *nyettan-myllaŋa* "7" (= 5+2, cf. *hittaka* "2" & *myllaŋa* "5"), Koryak of Karaga Isl. (Pallas) *nytyyaka-šit* "7" vs. *nityakaw* "2" or Itelmen of Tigil River (Billings / Sauer) *nittanoo* "2" (< Koryak ?) vs. *ittax-tenu* "7" (Anderson 1982: 30–31) etc., a source with a transparent etymology can be found.

Jurchen *dalhûn* (Janhunen) = *daRxwan* (Mudrak) "17" and Manchu *dorxon* "seven-years-old boy" are apparently of Mongolian origin (Janhunen 1993: 176 in contrary to Miller 1975: 147, seeing here an original Altaic archaism).

37. Tg **žabkun* "8" must be reconstructed with **-b-*. The change **-bk-* > **-pk-* is certainly more natural than the change **-pk-* > **-bk-*, presumed tacitly by Benzing or Starostin. The forms with **-b-* are really attested in Solon (Ivanovskij) *žabkun*, Lamut (Witsen) *ziabkan*, Lamut of Aldan (Billings) *digkabkan* (!). Starostin 1991: 141 segments his Tg reconstruction **žā-pku-n* "8", comparing it with OJp *ya-* "8" < **da-* without any deeper analysis. Ramstedt proposed two etymologies:

(i) **žab-* is identified with Evenki *žabdar* "long" (TMS I: 239), while the second component has to be borrowed from Sino-Korean *kon* "eldest (brother)"; Ramstedt supposes the following semantic development: "long brother" > "long finger" > "middle finger" > "8" (1949: 77; 1982: 89); there is a more elegant solution, identifying the second component with Tg **xuniakān* "finger" (TMS I: 276–277; Benzing 1955: 59), hence **žab-kun* "long finger" (a medial allophon of pTg **x-* is **-k-*, cf. the rule 22).

(ii) **ž-ap-kan* (sic) < **žu(r)-ap-* "2 before [10]", in analogy with Kor *yəðärp* < **yəṛ-tur-ap* "10–2-before", i.e. "2 before 10" (Ramstedt 1982: 19). This etymology can also be modified and so supported. Accepting the reconstruction **žabkun*, the segmentation **žV-* "2", **aba* "no, not" (TMS I: 3) and **-kun* is possible. The function of the last segment remains open. The same

-kun also forms the puzzling Lamut of Kamchatka Bay numeral *dgalkun* // *dagalkun* “6”, where the internal structure “4 subtracted from 10” is almost evident (see Tg “6”). It is tempting to assume that the enigmatic numerals 12–19 in South Tungus languages are terminated by the same suffix **-kun*. If we accept their identity, the meaning “10” of **-kun* is compatible with both its functions. This hypothetical conclusion has no evident support in the Tungus languages. Perhaps only the quoted Tg **xunākān* “finger” with the diminutive suffix **-kān*, which can be interpreted as a singulative. Hence the shortened form could mean **[all] fingers* > “10”.

Let us mention that Panfilov 1973: 9 reconstructed pNivkh **xon* “10”. Can it be the source of the suffix **-kun* ?

38. Tg **xünāgin* “9” should be reconstructed with **-n-* instead of **-y-* (Benzing) on the basis of the forms *unjun* “9” and *kunjun-tzu* “90”, recorded by Strahlenberg (1730) in one South Tungus dialect named Tongusu-Konni. The puzzling Jurchen *oniohūn* (Janhunen) = *onioxwan* (Mudrak) “19” also supports this reconstruction. The first component **xünā-* suggests the stem **xunā-* “finger”. The front vocalism could be caused by the suffix **-gin*, terminating perhaps also the numeral “4”. An alternative solution can be represented by a substratal origin similarly as in the case of the numeral “7”. A promising source appears again in the Chukcho-Koryak languages: Chukchi (Bogoras) *qonyá-čyŋken*, Oleni Koryak *xoia-čankin*, Paren Koryak *qoñhay-čyŋken*, Kerek *qunhay-čiji* “9” etc. (Anderson 1982: 30, 51, including the comparison of Koryak and Tungus numerals “9”).

Miller (1971: 237) finds a cognate of Tg **xüyägün* (Benzing) “9” in OJp *kökönö-* “9”, assuming the multiplication “3x3”. But he is not able to explain the difference between initial Tg **x-* and Mo *γ-* in *γurban* “3”. Starostin 1991: 141 reconstructs pTg **xegün* “9” for an easier comparison with OJp *kökönö-*, not respecting the forms as Jurchen *hujehun* or Evenki of Lower Tunguska *ijógjin* and the forms documenting the reconstruction **-n-*. It is interesting that this comparison does not appear in the *Comparative dictionary of Altaic languages* prepared by Starostin, Dybo & Mudrak.

Poppe 1960: 32–33 rejects the initial pTg **x-* and reconstructs **yegün*, comparing it with pMo **yersün*.

39. Tg **žuwan* “10” can be compared with Mo **žay/wun* “100” (see above) or with OJp *tōwo* “10”, implying in that case pAlt **č-* (Starostin 1991: 141 reconstructs pAlt **čuwa* “10”, while Vovin 1994: 106 **čuba-*; already Miller 1971: 220–221, 236 thought of this connection, speculating about pAlt **d-*). This numeral remains etymologically unexplained. Ramstedt’s derivation from the verb **žuwan-* “to open” would be perhaps acceptable but the correct meaning is “to yawn”. The comparisons with Kor *čjuŋ* “all (of numerals)” or *čoi* “all, altogether, entirely” are phonetically and semantically plausible but they are too isolated (more see Mo “100”).

Properly Tungus etymology cannot be excluded either — cf. Manchu *uʃan* “end, edge, limit, top” (TMS II: 250) and *uʃu* “head, beginning” > “the first” (Benzing 1955: 104; Poppe 1960: 63 finds cognates in WrMo *üʃügür* “Spitze, Oberende”, MMo *üʃü’ür* “Ende”), perhaps **uʃu-an* > **ʃu(w)an* “end of right [hand]” (cf. Tg **an-* “right” — see TMS I: 40–41).

40. Even **müan*, pl. **müar* “10” (TMS I: 534) forms also tens, cf. Even (Lamut in AP) *ʃyür-men* “20”, *elán-men* “30” = (Maydell / Schiefner) *dyor myär* “20”, *elán myär* “30”. The closest cognates can be OKor (pSilla) **tumur-* “20” (Krippes) and MKor *maion* “40” (Vovin) < **nay-mon* or **na-mion*? Ramstedt 1982: 105 compared it with Kor *mān* “hand”, *mandi-* “fingern, mit den Händen betasten” and the suffixes *-man / -ban / -ben* terminatig Mongolian numerals 3, 4, 8, 10. But there are at least alternative possibilities: (1) Kor *mān* “amount, size, measure, number”, compared by Ramstedt (1982: 105) with the Tg suffix **-mān* (e.g. **müar-man* “ten series” — TMS I: 534); (2) Kor *manhi* “much, many”, MKor *mān-hä*, related to OJp *mane-si* “many, numerous” and perhaps Chuvash *mōn* “big” (Ramstedt 1982: 106; Martin 1966: 41–42; Starostin 1991: 94–95, 144–145).

41. NTg **riamā(ʒi-)* “100” is phonetically compatible with OJp *momo* < pJp **muàmua* “100; a big number” and OTk *jom-γ̆* “all” (Starostin 1991: 78 reconstructs pAlt **ri[ua]mV* “a big number; 100”). Formally Mo **nayiman* “8” could perhaps also be added, although the difference in semantics remains puzzling (cf. the similarity of the numerals “8” and “100” in Sino-Tibetan). The Japanese word suggests an original reduplication. It is possible to imagine e.g. Even **müan* “10” reduplicated in the form **müanmüan-* “10 x 10”, giving NTg **riamā-*. On the other hand, the metathesis **müan* > **riam-* cannot be excluded either, cf. Manchu *niaman* “heart” < Tg **müawan-* (TMS I: 533–534). In that case the suffix **-ʒi(n)* can represent a reduction of the numeral **ʃuwan* “10”, cf. e.g. Evenki of Lower Tunguska *nemá-dje* “100”, where the same suffix terminates the numeral *mukónn-dje* “11”, *djuhr-dje* “12”, *ilán-dje* “13” (AP). The final *-n* is preserved in Evenki of Barguzin *njamá-ʒin* “100” (AP). On the other hand, in the suffix **-ʒi* the instrumental can be identified, forming also the collective numerals (Benzing 1955: 106).

An unexpected, suggestive, but probably unrelated parallel appears in South Lappic dialects, where *n'imme*, *n'ümme* etc. denotes “100”. Its etymology is apparent: Uralic **nimi* “name” (Finnish *nimi*, Hungarian *név* etc. — see Honti 1993: 149).

42. STg **taŋgū* “100” is very probably derived from the verb **taŋ-* “to read, count”, cf. Evenki *taŋū* “number”; Manchu *taŋgu* means both “100” and “quantity” (TMS II: 161–163). Nivkh (Amur) *r'aŋga* “much, many”, *n-r'aŋq* “one hundred” is undoubtedly a borrowing from South Tungus (Bouda 1960: 402).

Korean numerals

Besides the studies of Ramstedt devoted to Korean etymologies including numerals (1949, 1982), probably only Junker (1953) analyzed especially the Korean numerals (Krippes 1991: 150 quotes his not yet published study “The Phonetic History of Korean Numerals”. *Korean Linguistics* 7).

	Modern Korean	Middle Korean		Proto-Silla
	Lee 1977: 248	Lee 1977: 174	Vovin 1993: 248–249	Krippes 1991: 149
1	<i>hǎnna</i>	<i>hǎnnah</i>		
2	<i>tur</i>	<i>turh</i>		* <i>tubur</i>
3	<i>səys</i>	<i>səyh</i>	<i>sey(h)</i>	* <i>siri-k</i>
4	<i>nəys</i>	<i>nəyh</i>	<i>ney(h)</i>	
5	<i>tasās</i>	<i>tasās</i>		
6	<i>yəsās</i>	* <i>yəsīs</i>		
7	<i>nirkop</i>	<i>nirkup</i>		* <i>nir-k</i>
8	<i>yəǎǎp</i>	* <i>yəǎǎp</i>		* <i>yutur</i>
9	<i>ahop</i>	* <i>ahop</i>		
10	<i>yər</i>	* <i>yər</i>		
20	<i>sīmūr</i>	<i>sīmūr</i>		* <i>tumur-on</i>
30	<i>syərhin</i>	<i>syərhin</i>		* <i>siri-k-on</i>
40	<i>māhīn</i>	<i>māzān</i>	<i>māñon</i>	
50	<i>suyŋ</i>	<i>suyŋ</i>	<i>swin</i>	
60	<i>yəsyun</i>	* <i>yəsyuyŋ</i>	<i>yey.sywuyŋ</i>	
70	<i>nirhīn</i>	<i>nirhīn</i>		* <i>nir-un</i>
80	<i>yəñin</i>	* <i>yəñin</i>		* <i>yutur-un</i>
90	<i>ahīn</i>	* <i>ahān</i>		
100	(<i>pāik</i> < Chinese)	* <i>on</i>		

Comparative-etymological analysis

43. MKor *hannāh* (Lee) > NKor *hannā* “1” consists of the numeral proper and the numerative *nā* with a probable meaning “piece, face” (Junker 1953: 301). The closest cognate represents Manchu *sonio* “one, a single”, *sonixon* “single, not in pairs”, *son son i* “one by one, each for itself” (Ramstedt 1949: 60 compares also Ainu *shi-ne* “1” which is probably of Austric origin); cf. further W_rMo *sonduyai* “odd”, O_{Tk} *siŋar* “one of a pair” (TMS II: 111; Räsänen 1969: 417; Starostin 1991: 296). Starostin’s reconstruction of pAlt **s(i)onV* “one, single” can be modified in **soniV*.

44. MKor *turh* (Lee) = *tūr*h (Starostin) = early MKor (Nichū-reki) *tufuri* “2” < OKor **tüpör* ~ **tüßör* (Lee) = **tubur* (Krippes) = **tubir* ~ **tuwir* (Starostin) < pKor **twubwu-l* (Vovin 1994: 106) is compared with Tg **žöwä-(r)* “2; pair”, Mo **žirin* “2” (about women) (Ramstedt 1949: 274–275, Id. 1957: 65; Starostin 1991: 33). Martin 1966: 245 adds OJp *tur-e* “companion” (he and Ramstedt also speculate about Ainu *tu* “2” but also here a hopeful Austric etymology exists). Tk **dūr* “equal” and *[*d*]üŋ “pair” can be related too (see Mo “2”).

MKor *simür* “20” looks like a form quite different from the numeral “2”. Ramstedt 1949: 238 compared it with Manchu *simxun* “the fingers and toes — of man”. Krippes’ reconstruction of pSilla **tumur-* opens a possibility to connect it with the numeral “2” itself. It is tempting to see here the same structure as e.g. in Even of Oxotsk (AP) *žur-mer* “20”. Unfortunately, Krippes does not present any evidence for his reconstruction.

Miller 1996: 145 compares *-mür* in *simür* “20” (in his transcription *šmül.h-*) with Tk **-mül₂* forming the numerals “60”, “70” (see # 15). He finds a support for the primary meaning “ten” in NKor *mūs* “(a bundle of) ten (sheaves, fish, etc.); a plot of land from which ten sheaves of tax-grain are collected”.

45. MKor *səy-h* (Lee) = *səi* (Starostin) “3” must be reconstructed with **-r-* preserved also in *syərün* “30” (cf. pSilla **siri-k* “3” and **siri-k-on* “30” reconstructed by Krippes 1991: 149). Ramstedt (1949: 225 and 1957:65) compared it with Manchu *sertei* “one with three lips” (TMS II: 146) and WrMo *serege*, *serige*, *seriye* “trident, threepronged; fork”, Khalkha *serē*, Kalmyk *serē* “Dreizack, Gabel” (Ramstedt 1935: 325); Mo > Teleut *särä*, Soyot *serē* “Harpune” (Räsänen 1969: 411). Starostin, Dybo & Mudrak 1995, n. 1002 add Turkish *saz* “three-stringed instrument”, although they do not exclude its Persian origin.

The etymology is not solved. One possibility represents Tg **siru* “span” (the distance between thumb and forefinger) (TMS II: 80). The semantic motivation for the denotation of the numeral “3” can be based on the fact that the remaining fingers form a triple set of neighboring fingers. NKor *sur* < **səru* (?) “finger” (Ramstedt 1949: 245) and Tk **särä* “span” (“the distance between thumb and forefinger” in Oghuz group against “the breadth of four fingers” in Kyrgyz, Kazakh, Uzbek) (Räsänen 1969: 411) are probably also related. Dybo 1986: 54, studying the system of spans in Altaic languages, draws attention to Fenno-Ugric **sorV(-šV)* “span” vs. Fenno-Volgaic **sorme* “finger” (UEW 448, 765).

An interesting external parallel appears in Nivkh **te* “3” (Panfilov 1973: 9), although its relationship is not unambiguous.

Vovin 1993: 252, 256 comes with a revolutionary reinterpretation: he judges that the Korean initial *s-* in the numeral “3” reflects pAlt **ñ-* ! His main argument is based on Kor *tuə* “some few”, traditionally derived from *tu* “2” & *sə* “3” (Ramstedt 1949: 275). Vovin modifies the Middle Korean reading of this word in *two.ñe(h)*. His reading of the “triangle” sign as *-ñ-* looks convincingly for the medial position. But the conclusion pAlt **ñ-* > MKor *s-/ñ-* cannot be supported for the initial position by other Korean - Altaic comparisons. All the presented hopeful etymologies are in agreement with the rule 20. The only example of Vovin supporting his idea is the comparison of MKor *-ñe* “3” & OJp *mi-* “3”. His reconstruction of Tg **ñil-an* “3” is quite artificial. Perhaps the Tg numeral **ñöl[l]gün* “6” (if it means 2x3 as in Mongolian?) would fit better.

46. MKor *nəyh* “4” has no convincing etymology within Altaic (Ramstedt’s attempt to connect it with Evenki *növarkana* “four-years-old reindeer” — see 1982: 121 — must be rejected) with the hypothetical exception of Tg **nö[ŋ]gün* “6”, if the internal structure was “10 minus 4” (see Tg “6”). Kho 1975: 108 connects the Kor “4” with Fenno-Ugric **neljä* “4”. Menges 1975: 92 adds Dravidian **nāl* “4” besides the old comparison of Boller (1857) with Jp *yo-* “4” and even Samoyed **tettê* “4”, very probably of Turkic (Old Bulgarian) origin (Blažek 1998: 7). The loss of the expected **-r-* can be explained in a similar way as in the case of the preceding numeral, cf. also pSilla **narih* “river” vs. MKor *nayh* or **murih* “mountain” vs. later MKor *moyh* (Lee 1977: 80). Together with Nivkh *ny-lnu-* “4” (cf. also *n-mar-i* “quarter” < **ni-nar* ¹/₄ and *mi-nr* “8” = 2 x 4 — see Bouda 1960: 358) and Dravidian **nāl* “4”, a specific East Nostratic isogloss can be preserved here.

Miller 1996: 116 mentions the puzzling MKor forms for “4” written in Japanese *kana*-syllabic script, namely *towi*, *toFi*, *toi* (according to the book Nichū-Reki, AD 1139, *towi* means “3”, while “4” is *sawi*; the correct order should be evidently opposite, similarly as in the case of “5” and “6” — see Lee 1977: 101), finding in it a genuine correspondent of Mo *dörben* “4” etc. (# 22).

MKor *mazān* “40” in the traditional transcription (Lee) looks very strange in confrontation with *nəyh* “4”. Vovin 1993: 248, 255 convincingly demonstrated that the correct reading must be *mañon*. It is supported by early MKor source KYELIM YUSA (A.D. 1102–1106) written phonetically in Chinese characters, where the numeral “40” is transcribed *mae.nyin*. The form *mañon* “40” is compatible with *ney(h)* “4” (Vovin) in case of a metathesis from **naymon* or sim. The hypothetical second component **-mon* agrees fully with pEven **mān*, pl. **mār* “10” (TMS I: 534), forming also tens: Lamut (= Even) *dügün-men* “40” etc. (AP).

47. MKor *tasās* “5” can be analyzed as a compound of *tā* “all, every one” & *son* “hand” (Ramstedt 1949: 245, 258–259 sees in the first component a derivative of the verb *tatta* “to open”), hence “[the fingers of] whole hand” (Ramstedt 1949: 77; Junker 1953: 302–303), cf. also Tg “5”. The second possibility represents a comparison of the component **ta-* with the numeral “5” in other Altaic branches: Mo **tawu-* // Tg **tu(a)ñja* // Koguryō *utu*, OJp *itu-* (Miller 1971: 221; Starostin 1991: 70).

MKor *suyn* (Lee) = *swin* (Vovin) “50” supports the point of view that the bearer of the meaning “5” in *ta-sās* is more probably the second component derivable from *son* “hand”. The deviated forms *kaseto* “5” (Witsen) or early MKor (Nichū-reki) *hasusu* “6”, correctly “5” (Lee 1977: 101) can be interpreted as erroneous records. On the other hand, a different prefix could also be identified here, cf. e.g. the connecting particle *ka* (Ramstedt 1949: 80–81).

48. MKor *’yəsīs* “6” has been segmented *’yə-sīs*. Ramstedt 1949: 77 connects the second component with *-sās* forming the numeral “5”, hence ulti-

mately with *son* “hand”. In the first component he sees the verb *yalda* “to open” or its derivative (after Ramstedt) *yər* “10”, cf. *’yətīrp* “8” < **’yər-tur-əp* “ten-two-lacking” (Miller 1971: 244). It is certainly possible, only the semantic function of *-sīs* remains open.

The other possibility follows from the law described by Vovin (1993: 250–252): the medial **-ri-* became *-s-* in southern and Hamkyeng dialects and this change also influenced the central dialects. It means that the attested MKor form *’yāsīs* could originate from **yənīs* (the influence of the preceding numeral *tasās* “5” must be also taken into account), suggesting a hypothetical archetype **yər-riəy-əp(s)* “ten-four-lacking”.

Starostin (1991: 141) speculates about the loss of **n-* assuming an original archetype **njə-*, to be compared with Tg **ñu-ŋu-n* “6” (Starostin) and OJp *mu-*.

49. MKor *nirkup* “7” was analyzed as **(n)ir-* (cf. SKor *ilgop*) & **-kop* “three bending” by Ramstedt 1949: 77, 124, 167, cf. Evenki *ilan* “3”. Miller 1971: 244 proposes his own solution, which agrees with the internal structure of all the numerals 6–9: *yər-’γu-əp(s)* “ten-three-lacking”. It is interesting to confront it with the record of Witsen (1705) *yer-op-čil* “7” (Anderson 1982: 58). Starostin 1991: 141 compares the first component *nir-* with Tg **nadan*, OJp *nana-*, Tk **jätti* “7”, explaining either the internal structure of all the word or the phonetic differences. Ogura (quoted after Ohno 1970: 132) sees here a transformation of WrMo *doluyaburi* “forefinger”.

50. MKor *’yətīrp* “8” was analyzed as **yər-tur-əp* “ten-two-lacking” (Ramstedt 1949, 76–77; Miller 1971: 244), cf. Kor *əp(s)* “to be lacking” (Ramstedt 1949: 56). Junker 1953: 306 admits a relationship to Jp *yattsu*, OJp *ya-tu* “8”. Tg **žabkun* “8” can be analyzed in a similar way, i.e. **ž(u)-ab-kun* “two-lacking of-ten”?

51. MKor *’ahop* “9” is not so transparent as “8”, but Miller 1971: 244 is probably right when deriving the numeral from a compound of the same internal structure as all the numerals of the interval 6–9: **yər-hän-əp* “ten-one-lacking”.

Ramstedt 1949: 77 derives it from NKor *a* “child” and *kop-* “to be crooked”, hence “the little one bent”. Junker 1953: 306 noticed that one would expect **agop* in this case.

52. MKor *’yərĥ* (Lee) = *yər* (Starostin) “10”, together with *yəršĥ* “a big quantity, number” (Starostin), have hopeful Altaic cognates: Tk **jūř* “100” // Mo **yersün* “9”, **yerin* “90” besides WrMo *yerü* “the most of...” // OJp *yoro-du* “10.000” (see Tk “100” and Mo “9”). The meaning of the pAltaic archetype **yeřü* “could be “the greatest [number]” or sim.

53. MKor *’on* “100” has the closest cognate in Tk **ōn* “10” (Ramstedt 1949: 177). The final component **-on/*-un* (pSilla reconstructions of Krippes) forming

tens (cf. the termination **-an* /**-in* of tens in Mongolian) represents probably the same stem. It means that its meaning should be “ten”. In that case the original form of the numeral “100” in early Korean was **yər-on* “the biggest ten”, similarly as in Tk the numeral **jūr* “100” can represent a reduction from the original **jūr-ōn* “the biggest ten” (cf. Ramstedt 1907: 19). The most hopeful etymology of the Tk-Kor issogloss leads to MMO *ono-* “zählen” (Haenisch 1939: 125; see Tk “10”), hence the original meaning was probably **“number”*.

Japanese numerals

Japanese numerals were specially studied in Miller 1971: 219–245.

	Japanese	Old Japanese	Proto-Japanese	Koguryō			
	Modern	Pallas #166 (*)	Miller 1971: 220	Starostin 1991	Murayama	Lee	Miller 1971: 239–41
1	<i>hitotsu</i>	<i>fito-c</i>	<i>fitō-tu</i>	<i>*pitə-</i>			
2	<i>futatsu</i>	<i>vta-c</i>	<i>futa-tu</i>	<i>*putə-</i>			
3	<i>mi(t)tsu</i>	<i>mi-c</i>	<i>mi-tu</i>	<i>*mi-</i>	<i>*mi(l)</i>	<i>*mir</i>	< <i>*mit</i>
4	<i>yottsu</i>	<i>yu-c</i>	<i>yō-tu</i>	<i>*də-</i>			
5	<i>itsutsu</i>	<i>isy-c</i>	<i>itu-tu</i>	<i>*itū-</i>	<i>*utu</i>	<i>*üc</i>	
6	<i>muitsu</i>	<i>mu-c</i>	<i>mu-tu</i>	<i>*mu-</i>			
7	<i>nanatsu</i>	<i>naka-c</i>	<i>nana-tu</i>	<i>*nānə-</i>	<i>*nanun</i>	<i>*nanəŋ</i>	
8	<i>yattsu</i>	<i>ya-c</i>	<i>ya-tu</i>	<i>*da-</i>			
9	<i>kokonotsu</i>	<i>nogono-c</i>	<i>kōkōnō-tu</i>	<i>*kəkənə-</i>			
10	<i>tō</i>	<i>to</i>	<i>tōwo</i>	<i>*təwə</i>	<i>*tɛ(k)</i>	<i>*tɛk</i>	
-ty	<i>so</i>		<i>-so-ti</i>	<i>*-so</i>			
100	<i>momo</i>	<i>inyagu</i>	<i>momo</i>	<i>*muəmuaə</i> , cf. Ryukyu <i>mumu</i>			

* The dialect of Japanese sailors shipwrecked near Oxotsk (Pallas 1787: XIV).

Comparative-etymological analysis

54. OJp *fitō-* < **pitə-* “1” is related with Tk **bīr* “1” // Mo **büri* “all, each” // MKor *pīrfs(ō)* “at first”, *pīrfs-* “to begin” (Martin 1966: 238; Miller 1971: 230; Starostin 1991: 99; 73 about the change **-r- > Jp -t-*; he opines that Mo *ü* is secondary).

Murayama and Kawamoto connect Jp “1” with Austronesian **it'a?* “1”, postulating a prefix **p-* (a discussion and references see Starostin 1991: 99).

Benedict 1990: 225 finds a cognate of Jp “1” in Austronesian **pi[t.ɔŋ]* “one-eyed”.

55. OJp *futa-* < **putə-* “2” can be compared with MKor *pčak* “pair” > mKor *ččak* id., cf. *ipčak* “this side” (Ramstedt 1949: 19) and Tk **bučuk* “half” (Räsänen 1969: 85; Sevortjan II: 283–284) — see Starostin 1991: 109.

An alternative comparison of Murayama and Kawamoto with Austronesian **parʼaŋ* “pair” looks more hopefully than their Japanese-Austronesian comparison for “1” (quoted after Starostin 1991: 109). Concerning the different root vocalism, cf. Jp *futsuka* “20th day [of the month] vs. *hatachi* “20 years old” (Miller 1971: 226).

Benedict (1990: 227, 257) differentiates the Austronesian cognates of (1) OJp *futa-* “2”, and (2) *fata-* “20”, which should be (1) pTsuic **-pusa-* “2 (years, nights, etc.)” and (2) Austronesian **pats₁₂₃aŋ* “pair” respectively.

Miller (1971: 230) speculates about unattested pJp **yuta-* “2”, changed into **puta-* under the influence of **pitə-* “1”. This hypothetical form has to be compatible with MKor *turh* and Tg **žöwār*.

56. OJp *mi-* (Miller) = *myi-* (Martin; see Vovin 1993: 256) “3” has no convincing etymology. The only evident cognate is Koguryō **mi(l)* (Murayama) = **mir* (Lee) < **mit* (Miller) “3”. The puzzling root **mu-* isolated from the unique form *mugina-zian* “30” attested by Witsen (1705) in Lamut (= Even), could also be related. It is tempting to add Dravidian **mūŋ-* “3”, originally perhaps named after “protruding [finger]” (Andronov 1978: 242). Menges (1975: 92–93: Jp+Dr) also mentions Burrow (BSOAS 11[1943]: 334), comparing the Dravidian “3” with Samoyed **nākur* “3” (see Mo “3”).

Vovin (1993: 252, 254) proposes a rather risky comparison of Jp “3” with MKor *sey(h)* & *-ŋe* “3” < **ŋe[]i* and Tg **[ŋ]ilan* “3” (there is no evidence for **ŋ-* = **s-*).

Miller (1971: 238–239) is probably wrong, connecting the Japanese-Koguryō isogloss “3” with Tk **ūč* “3” (Menges 1975: 93).

57. OJp *yö-* “4” has been derived from pJp **də-* and compared with Tg **duj-gin* // Mo *dör-ben* // Tk **dört* (Starostin 1991: 71 reconstructs pAlt **tūr* ~ **tör*; about the loss of *-r-* see p. 73; similarly Vovin (1993: 106), reconstructing only pAlt **tV-*, while Miller 1971: 221 presents the archetype **dör-*; cf. also Murayama 1962: 108 and 1966: 154 **dō̄-*).

Rahder, MN 8[1953]: 265 connects Jp *yö-* with Kor *nəy-* “4”, demonstrating the vacillation *n-* ~ *y-* by examples, like e.g. OJp *nubu* “to sew” vs. *yubu* “to bind” // Kor *nupi-* “to quilt, stitch”; he quotes (p. 285) the point of view of H. Izui concerning a common origin of Japanese, Korean and Fenno-Ugric numerals “4” (see Kor “4”). Similarly Menges 1975: 92 and Kazár 1980: 210–211 compare OJp *yö-* with Fenno-Ugric **neljä* “4”, and eventually also with Samoyed **tetš* “4” (Janhunen 1977: 159). But the latter form is apparently borrowed from some Turkic language of a Bulgarian-Chuvash type (Blažek 1998: 7).

Benedict 1990: 196 derives OJp *yö-* from a reduplicated form **yöyö-* and connects it with Austronesian **(x₂)x₂əpat* “4” !

58. OJp *itu-* “5” has been compared with the numeral “5” in other Altaic branches (excluding Turkic) with initial *t-*: Mo **tawu-* // Tg **tu(a)ŋja-* //

MKor *tasās* (see above). But a vowel preceding *t* appears only in Koguryō *utu* (Murayama) = *úc* (Lee) “5” and Old Bulgarian **etə* “5” (Mudrak) and perhaps in puzzling Chagatai *ittik* “50” (see Tk “50”). Vovin tries to reconstruct **i-* in Tg, postulating the following development **ituŋa* > **tjuŋa* > STg **cunža*. There is also an interesting extra-Altaic example in Eskimo *itu-mak* “the palm of the hand” (Thalbitzer, *JSFOu* 25/2[1908]: 23). On the other hand, Starostin 1991: 138, fn. 138 (sic) thinks that *i-* appears secondarily influenced by the numeral *i* & *i-so* “50” (origin ?).

Rahder, *MN* 9[1953]: 238–239 sees in *i-* a relic of ***in* corresponding to Palau *im*, Atayal *ima-* “5” < Austronesian **lima*’ (cf. also Benedict 1990: 206).

It was already Boller (1857) who compared Jp *itu-* with Fenno-Ugric **wīt(t)i* “5” (Sammallahti 1988: 489) = **witte* (UEW 577), related to Samoyed **wüt* “10” (Janhunen 1977: 177; Sammallahti 1988: 541 reconstructs pUralic **wit(t)i*) — see Menges 1975: 95 (Jp+FU), Kazár 1980: 60 (Jp+Ur). This comparison could be acceptable also from the point of view of the Nostratic hypothesis, assuming a regular correspondence Uralic **w-* vs. Altaic **∅-//*b-*, depending on the following vowel (Illič-Svityč 1971: 150).

59. OJp *mu-* “6” has been traditionally connected in one pair with *mi-* “3” (Schott 1853: 11; Miller 1971: 237–238; Menges 1975: 92; Ivanov 1977: 36; Syromiatnikov 1981: 71).

Starostin 1991: 78, 141 compares *mu-* with the Tg counterpart reconstructed and segmented by him **ñu-ŋu-n* “6” (similarly Vovin 1993: 106).

Menges 1975: 94 mentions Boller, the first one to compare Jp *mu-* “6” with Samoyed **mâktut* “6” (Janhunen 1977: 85), cf. also Kazár 1980: 108. But the Samoyed numeral is etymologizable on the basis of Samoyed **mâkâ* “back” (Janhunen l.c.), similarly as Fenno-Ugric **kãt(t)i* “6” vs. **kuttV* “back” (UEW 225); hence “6” = “beyond [5]” is quite plausible (Blažek 1998: 8).

60. OJp *nana-* “7” together with Koguryō **nanun* (Murayama) = **nanən* (Lee) “7” has been compared with Tg **nadan* “7” (Rahder, *MN* 8[1953]: 281; Murayama 1958: 229; Hamp 1970: 197; Syromiatnikov 1981: 71; Starostin 1991: 141; Vovin 1993: 106). None of them offers any further etymology. Miller (1971: 241–242) sees borrowings in Japanese & Koguryō numerals “7”, together with the Tungus counterparts, ultimately from some Mongolian source (see #36).

Our hypothesis of the borrowing of Tg **nadan* “7” from some substratal source, probably of a Chukcho-Koryak type, also implies a similar origin or a cultural diffusion for the Japanese — Koguryō isogloss. Anderson 1982: 42 mentions a set of very strange Japanese numerals compiled in the *Comparative dictionary* of Pallas (1787) there is, including *naka-c* “7”. Anderson’s interpretation “2+[5]” has no concrete support within Altaic, but it is explainable thanks to Chukcho-Koryak, cf. e.g. Koryak (Krašennikov) *nãkoletenyak*,

Oleni Koryak *niyax-malagan*, Koryak of Kamenskoe *ḡáa-mádləŋen* “7”, in both of the last examples evidently “2+5” (Anderson 1982: 30).

On the other hand, in the case of this deviant form, it is possible to imagine a contamination of the properly Japanese numeral with Nivkh *ḡamg* “7”.

61. OJp *ya-* “8”, frequently also “several” (Syromiatnikov 1981: 71), has been derived from *yö-* “4” by means of an “internal apophony” (Miller 1971: 231; Syromiatnikov 1981: 47, 71). At the same time, Miller l.c. connects it with Tg **žabkun* “8”, similarly Starostin 1991: 141; Vovin 1993: 106. But Tg **žabkun* probably represents an innovation with the inner Tungus etymology (see above). It is remarkable that elsewhere Miller compares the Tg “8” with Jp *tako* “octopus” (1971: 85).

Kazár 1980: 208–209 sees a counterpart of OJp *ya-* “8” in Ugric **riälV* “8”, referring to the equation OJp *yö-* “4” vs. *ya-* “8” = FU **neljä* “4” vs. Ugric **riälV* “8”. This point of view seems to be the most probable, although the Fenno-Ugric example is comparable with the Japanese pair only typologically (OJp *y-* does not correspond to FU/Ur **i-*).

62. OJp *kökönö-* “9” cannot be derived from Jp *kokodaku* (OJp **kököda-*) “very many” (Ohno), as it was demonstrated by Miller (1971: 236).

Starostin (1991: 141) compares it directly with Tg “9”, in his reconstruction **xegün*, similarly Vovin 1993: 106, reconstructing Tg **xegin*. These reconstructions cannot explain all the historically attested forms, as it was explained above (#38). A more plausible archetype could be **xiüägín*, even closer to the Japanese form. Taking in account the deviating form *nogono-c* “9” (Pallas 1787, # 166), the hypothetical pJp **kənəkənə-* corresponds to the Tg numeral one-to-one. Above it was demonstrated that Tg **xiüägín* “9” can be analyzed as a derivative of **xüia-kān* “finger”, hence “9” = *[one] finger [lacking], or it can represent a borrowing from a Chukcho-Koryak substratum. On the other hand, the Japanese numeral is unanalyzable. It means that a borrowing from Tungus represents not only legitimate, but also probable possibility.

Miller (1971: 237) sees in OJp *kökönö-* and Tg **xiüägün* (Benzing) a multiplication “3 x 3”. In Tg it is improbable for phonetic reasons (see the discussion in # 38). The Japanese numeral, esp. accepting the reconstruction **kənəkənə-*, really can be interpreted as the multiplication (see #21). The multiplication “3 x 3” forming the numeral “9” is not usual, but it does not mean that it cannot exist. E.g. in various dialects of the Yuma group of the Hokan language family just this structure is safely recognizable: Cocopa *xwak* “2”, *xəmək* “3”, *xmxuk* “6” = “3 x 2”, *xmxmuk* “9” = “3 x 3”, Yuma *xavik* “2”, *xamók* “3”, *xümxuk* “6”, *x^hmx^hmók* “9”, etc. (Langdon & Munro 1980: 124–125).

Shiratori (1937) explains Jp *kokono-* on the basis of *koko* “bend” and *na* “not”, hence “not obtained by bending” (see Miller 1971: 234).

63. OJp *tōwo* “10” cannot probably be derived from OJp *tōwomu* “to be bent, be curved”, nor from *tawomu* “bent”, Jp *tawamu* “to bend, be bent” (Ohno 1955, against Miller 1971: 232).

Miller 1971: 235–236 prefers the relationship to Tg **žuwan* “10”, starting from the initial pAlt **d*-. Similarly Starostin (1991:141) and Vovin (1993: 106), but they reconstruct pAlt **čuwa* and **čuba*- respectively, however without any attempt of etymology. Kor *čoi* “all, altogether, entirely” (see Tg “10”) is compatible semantically, and with **čuwa*- also phonetically.

Elsewhere Miller (1971: 233) rejects Ozawa’s comparison of OJp *tōwo* “10” and WrMo *tabun* “5” for different semantics. But if we accept the most hopeful etymology of Tg **tu(a)riŋa* “5” = *“(all) fingers”, and its relationship with Mo **tawu*- “5”, the original meaning “all [fingers of one / two hand(s)]” can also represent a primary semantic motivation for “5” and “10”.

The position of Koguryō *tē (k)* “10” remains obscure; it is remarkable that Miller (1971: 236) prefers to connect it with OTk **tokuz* “9” (not “10”!!) rather than with OJp *tōwo* “10”.

Ramstedt (1982: 212) compared Jp *tō* “10” with Ainu *toe, toye* “many” and with Kor *tōj*-, *tō̄*- “to be thick”.

64. OJp *-so* forms the tens 30–90. Its etymology is obscure. Ohno (1955; see Miller 1971: 227, who rejects this comparison) and Murayama (1958: 229) connect *-so* with Korean *son* “hand”. Miller (1971: 227) sees here an allomorph of OJp *tōwo* “10”, referring to the *t-/s*-variation described in Japanese.

Benedict 1990: 224–225 compares it with Kadai **tsia* and Austronesian **?itsa* ~ **?atsa* “1”, **-tsa* “(compound) one”, widespread in Austronesian in “10”, “100” and “1000”.

65. OJp *momo*, Ryukyu *mumu* “100” are formally compatible with NTg **riamā*- “100” (Starostin 1991: 78 reconstructs pJ **muàmua* and adds OTk *jumyi* “all”, *yom*- “to collect” — see Sevortjan IV: 219–220). More about it — see # 41.

Abbreviations

AA Afroasiatic, Alt Altaic, AP Asia Polyglotta of Klaproth, Dr Dravidian, FU Fenno-Ugric, IE Indo-European, Jp Japanese, Kor Korean, m modern, M Middle, Mo Mongolian, N North, O Old, p proto-, S South, Tg Tungus, Tk Turkic, Ur Uralic, Wr Written.

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AOH *Acta Orientalia Academiae Scientificarum Hungaricae*.

ArOr *Archív orientálnf.*

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- JRAS *Journal of the Royal Asiatic Society*.
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